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IN ITS 75th YEAR

March 14 1959

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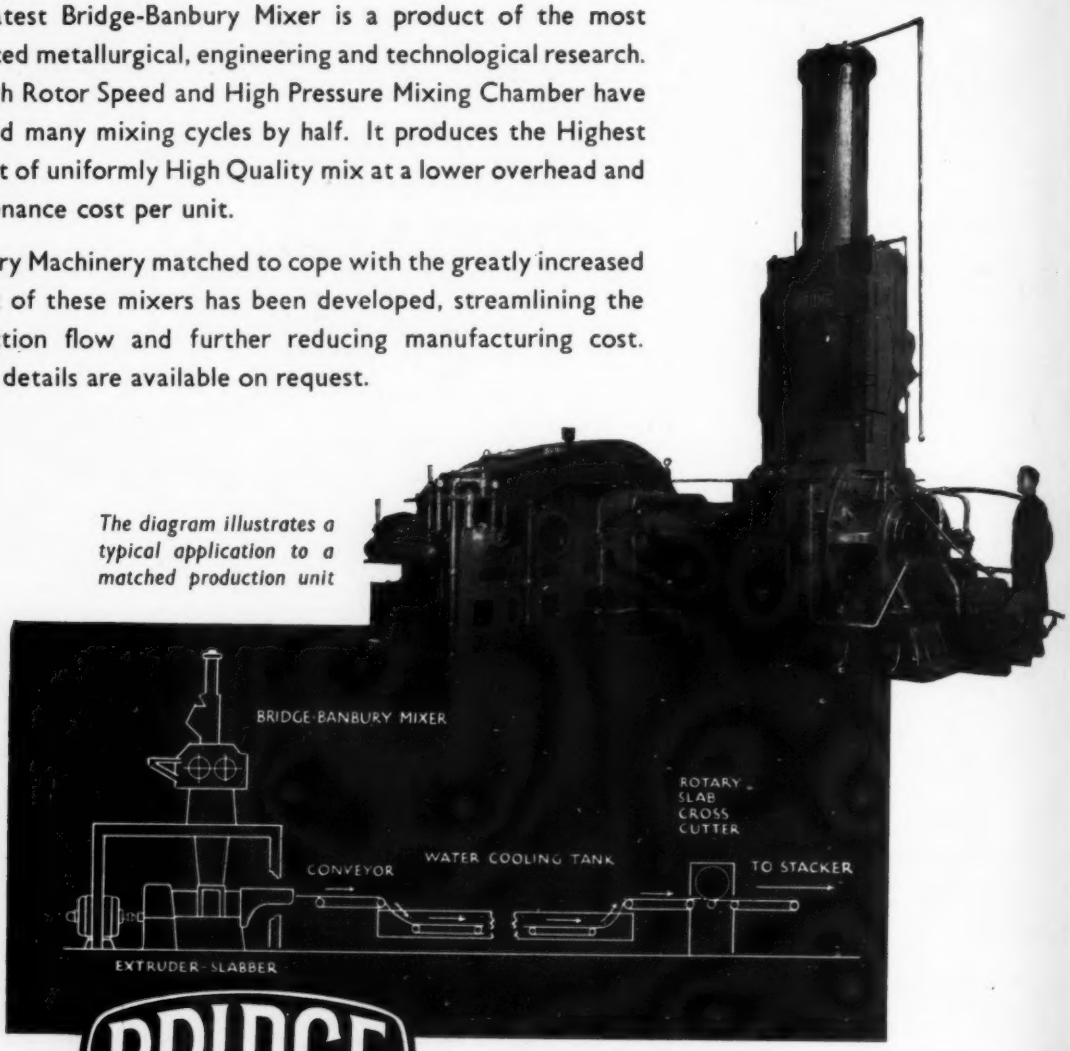

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NOTES of the WEEK

Worker and Job

FITTING the job to the worker is becoming more and more actual, for recent developments in technology and automation are far from having solved many problems concerning the welfare of workers in their jobs. In many cases, in fact, new and more complex situations have been created. In these circumstances, the psychologist and the physiologist have co-operated with management and labour in sorting out and analysing the problems involved. In Zurich last week, these problems were discussed at an international conference organized by the OEEC European Productivity Agency. The conference formed part of International Mental Health Year activities and of a worldwide campaign to develop knowledge and techniques for dealing with the problems of human relations in industry. Among the many interesting points made by participants from 13 countries was one by Professor A. T. Welford, St. John's College, Cambridge. In his opening address, Professor Welford said that recent studies to understand the human capacities which limit performance had led to 'the recognition that it is preferable to design machinery and other equipment in such a way that the demands upon operators are kept within limits of these capacities, rather than endeavour by training and selection to fit operators to demands dictated solely by engineering considerations.' Equally interesting was the statement by Dr Heinz Schmidtke, Germany, based on statistical calculations, that the introduction of regular short pauses results in no way in a decrease of performance but that it helps to activate the often existing reserves of efficiency.

Character of Difficulty

AN interesting comment made at the conference, from the psychological point of view, was that of Dr Schnewlin, Switzerland, who held that there must be preserved in the work a 'character of difficulty' to be overcome in order to maintain the workers' interest and overcome boredom. The same speaker insisted on the need for what he described as a harmonious succession of periods of work and rest. Movements, he added, should be without sudden acceleration or stops. Included among the conference subjects was the presentation and use of information from the work process. With computers and other electronic brains already, as it were, crowding about us and with the promise, or threat, of further spectacular progress in these fields—shades of man in space—the subject was aptly chosen. One speaker had this to say: 'The problem of indicator design, where man and machine meet in a relationship, should be studied by engineers and human biologists together.' Professor Faverge, France, said that a workplace should be designed around the worker in such a way that all indications and controls are a natural extension of his neuro-muscular system. Perception must not be divorced from action and controls must complement the operator's physical system. The conference provided a valuable opportunity for employers and workers to discuss the techniques and results of biological sciences applied to the problem of fitting the job to the worker. It should serve also to make industry aware of the possibilities offered by modern science for improving working conditions.

A Very Movable Feast

THE Easter holidays are early this year, Good Friday falling, as we know, on the 27th of this month. But that is not the earliest possible date: it could be a week sooner, it could be more than a month later. The full running or roaming period is 35 days. Business people often wish to learn, for number-of-working-days comparison purposes and so on, the incidence of the holiday for some future year, and if one hasn't a long-term calendar handy this is the established formula for making the calculation: 'Easter Day is always the first Sunday after the full moon which happens upon, or next after, March 22; and if the full moon happens upon a Sunday, then Easter Day is the Sunday after.' It all seems, to put the matter mildly, rather an archaic formula for these days. Yet is it generally known that there is actually an Act on the Statute Book which fixes the date of this holiday as the first Sunday after the second Saturday in April? It was passed (the Easter Act, 1928) 31 years ago this month, but before it can be become operative an enabling Order-in-Council has to be issued. For various reasons (mostly opposition by some religious groups) such an Order has never been made. But why wait? Why should not Parliament authorize a 'lay' holiday altogether apart from feasts and festivals? A fixed date, something sensible like the first Monday in the month as for August Bank Holiday. Leading trade organizations could get together and press for this, now, after three decades. On the other hand, perhaps the very 'movability' of Easter has a worthwhile charm about it in these rather regulated and routine-bound days.

NEWS *Briefs*

NAIROBI TYRE FACTORY—US LOANS TO SOUTH AMERICA—ESTATE RAIDS IN NORTH SUMATRA AUSTRALIAN GUAYULE PLAN — FLEXIBLE BARGE

●**United Kingdom** — The flexible barge being developed under the sponsorship of the National Research Development Corporation has made its first commercial voyage. It delivered a cargo of 10,000 gallons of kerosene from Esso's refinery at Fawley to Newport, Isle of Wight. An envelope of nylon and synthetic rubber, the barge was towed by a 45hp launch and completed the 10-mile voyage in two hours, after which the cargo was pumped into storage tanks in 65 minutes. It was then filled with CO_2 and towed back. These vessels cost in the region of £3,000 each.

●**United States**—The Export-Import Bank has announced the grant of an eight million dollar loan to Plasticas Argentinas Koppers, SA. The loan was made from the 100 million dollar credit authorized by the Bank to Argentina on December 29, and would be repaid in six years beginning December 1962. The proceeds would be used by the company to buy US equipment for a new 17 million dollar ethylene and polythene factory to be built near Buenos Aires, the Bank said. The factory which is due to start operations in 1961 would make the first use of gas from the refinery operations of Yacimientos Petroliferos Fiscales to produce polythene.

●**New Zealand**—Formica Ltd. of London, in which De La Rue holds 60% and American Cyanamid 40%, has registered a new subsidiary—Formica (NZ) in New Zealand with an authorized capital initially of £250,000. The company will manufacture Formica decorative laminated plastics. Sales in New Zealand have increased to the extent over the last ten years that a local manufacturing unit is necessary. A factory site has been purchased at Papukura, near Auckland, and building will start shortly.

●**Kenya**—Avon Tyre Remoulding Services Ltd., a subsidiary of the Avon India Rubber Co. Ltd., is to produce 200,000 cycle tyres a year at a new factory opened in January in Nairobi, reports Barclays Bank D.C.O.

●**Australia** — A group of American businessmen is to study the possibility of farms to produce rubber from the guayule plant being established in Western Australia, the Deputy Premier of the State, Mr John Tonkin, has announced. He said the principal of the group accompanied by a scientific expert was due in Perth at the end of March. The plans envisage ten thousand acre units, each with a central factory capable of producing ten million lb. of rubber yearly.

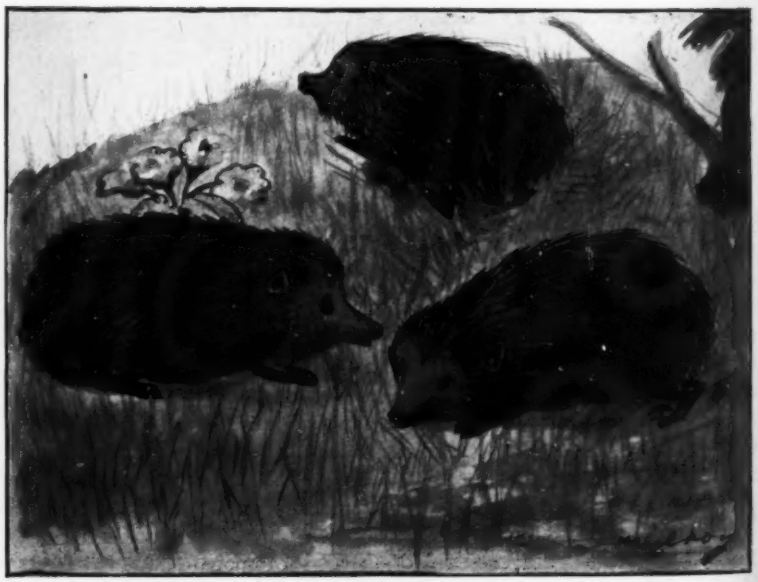
●**Guatemala** — The Development Loan Fund of the USA has granted $5 million of a $9 million credit requested by Guatemala, to assist in financing the development of rubber plantations on 80,000 acres adjacent to the Pacific Coast. It is thought that rubber could rival coffee as a major source of foreign exchange as Guatemala has large areas of land where rubber could be produced, and the country is one of the few in the world where rubber trees are free of disease.

●**Indonesia** — Rebels have resumed guerilla attacks on British and Indonesian rubber estates in North Sumatra after two months of comparative inactivity, estate agents said in Djakarta on March 7. Bands of 40 to 50 rebels are roaming the Linely Renkauprapat area, 200 miles south of Medan, the North Sumatran capital, burning factories, lorries and rubber stocks and looting houses. Reports state that at the British-owned Sungei Rumbih Estate the rebels set fire to the factory. North Sumatra police said on February 27, 50 rebels attacked the Laut Tadur Estate at Tebintinggi. They set fire to offices and storehouses, burned three lorries and 125 tons of rubber worth 2,400,000 rupiahs (about £30,000).

●**United States** — A new product called vinyl-coated steel sheet, made from a mixture of steel and plastic, is being manufactured by the US Steel Corporation. A company spokesman said recently the material was being successfully used in the making of furniture, wall panels, television cabinets, air conditioners and other products. Mr Richard Lord, director of the product development division of the company, said the new material had decorative value and a soft quality similar to leather or tweed materials.

●**Venezuela**—The Venezuelan Government is reported to be paying the wages of 3,000 young men for a period of 100 days, while they work as apprentices in rubber manufacturing plants. Afterwards they will be permanently employed by the industry.

●**United States**—The National Distillers and Chemical Corporation has reported that in 1958 polythene surpassed industrial alcohol for the first time as the biggest selling item on dollar volume for the company's chemical division.



'Filthy rich—even has his quills set in foam rubber!'—430

International Competition in the Chemical Industry*

PLASTICS INSTITUTE ANNUAL LECTURE

THE tenth annual lecture of the Plastics Institute was given in London by Mr S. P. Chambers, deputy chairman of I.C.I. Ltd., on March 12.

Foreign trade, said Mr Chambers in his opening remarks, had a more important place in Britain's economy than it had in that of most other large countries. Our import bill—to be paid for by our exports—amounted to nearly one-quarter of the national income. For Western Germany the proportion was about one-sixth, and for the United States it was about one-twenty-fifth. We had, almost literally, to export to live; our exports paid for much of our food and our raw materials. When, therefore, Britain's proportion of world trade was seen to be declining we could not shrug off the matter as disappointing but of secondary importance. On the other hand, diatribes on the decline of British industry, the laziness of her industrial population and the lethargy of her industrial leaders were neither helpful nor anywhere near the truth.

Foreign Trade

The truth could be found only by some patient analysis of our foreign trade to see why there was this relative decline, what the bright spots were and what hopes there were for the future.

Only one aspect of this subject—the international competition in the chemical industry—was their immediate concern, said Mr Chambers, but certain lessons could be drawn from this part of the subject that were of wider significance. First, it was dangerous to draw conclusions from the global figures of exports and from the percentage growth of exports as given in the published statistics. Some classes of exports will be declining, others static, and others growing. Also, because of the rapid growth of industry in areas hitherto underdeveloped, or the rehabilitation of areas prostrated by war, such as Western Germany, a declining percentage of world trade for Britain might conceal an absolute growth at a satisfactory rate.

By way of illustration, he pointed to some published figures taken from the Monthly Digest of Statistics for December 1958. Comparing 1938 figures with the latest figures available for 1957 or 1958, the monthly average sale of coal for bunkers had fallen from 874,000 tons to 65,000 tons; woven cotton piece goods from 114 million sq. yd. to 33 million sq. yd. The export of woollen fabrics, on the other hand, had remained fairly static, and so had the export of locomotives and leather. With the industries, however, the picture changed dramatically. Exports of agricultural machinery rose twelve-fold during this period; non-electrical prime movers nearly thirty-fold, motor cars ten-fold, tractors fifteen-fold, refined petroleum eighteen-fold and last, but by no means least, plastic materials fifty-fold—from 5.7 thousand cwt. per month in 1938 to 262 thousand cwt. in November 1958. As a country we could go on struggling to sell such commodities as coal, locomotives and cotton piece goods, but the future lay with the newer industries, including the chemical industry.

In 1950 exports of chemicals represented 7.8% of total British exports; in 1956 the percentage had risen to 9.3%. For the world as a whole, chemicals represented 10.5% of total exports in 1950 and 11.2% in 1956. Thus, although as a proportion of total exports chemicals are smaller for the UK than for the world as a whole, the increase in chemicals as a proportion of our total exports had been a little greater than for the world as a whole.

As a producer of chemicals Britain took third place in 1913, the first and second places being taken by the US and Germany. The US percentage of world production was 35.6, Germany's 25.2 and Britain's 11.5. By 1954, the latest year for which there were figures, Britain had risen to second place and Germany had fallen to third; but these figures needed careful interpretation. For one thing, the Iron Curtain countries were not included. Also, the proportions taken by these countries had altered materially. The US percentage had gone up from 35.6 to 52, the UK had dropped from 11.5 to 8.9, Germany from 25.2 to 7. The proportions produced in all other countries, except Canada and Japan, had fallen.

Regarding exports of chemicals, the US still took first place, but Germany moved up to second place, with the UK third and France fourth. The proportions of the free world trade in exports taken by these countries were very different from the proportions of total production. Thus in 1954, although the UK production amounted to 8.9% of the world production, our exports amounted to 15.9% of world exports. The US with 52% of the world's output had 28% of the exports, and West Germany with the figure of 7% of output had 16.9% of exports.

General Trends

There had been a trend in recent years for the proportion of exports to industrialized areas to grow, and the proportion going to non-industrialized areas to decline. This was true of total trade, including manufactures, raw materials, food, etc., and also true of chemicals. Mr Chambers went on to outline exports on the arbitrary basis of industrialized and non-industrialized areas. Exports of all kinds to the industrialized areas rose from 58% to 61%, while exports to non-industrialized areas fell from 42% to 39%. In the same way the exports of chemicals to industrialized areas during the same period rose from 49% to 52%, while exports to non-industrialized areas fell from 51% to 48%. If, as he believed, these figures indicated a general trend, it was important to see to what extent our exports, and particularly our exports of chemicals, went to industrialized countries and to non-industrialized countries respectively. In this we were less favourably placed than other countries. In 1956, for example, only 36% of British chemical exports went to industrialized countries, whereas of West German chemical exports no less than 66% went to industrialized countries, and Switzerland with 60% and France with 45% both did better in this respect than the UK.

** The Plastics Institute's Tenth Annual Lecture was given on March 12 in London by S. P. Chambers, C.B., C.I.E., Deputy Chairman, Imperial Chemical Industries Ltd.*

If we looked at exports over a very long period the figures for Britain looked rather gloomy. Britain's percentage share of world trade in all manufactures had fallen between 1899 and 1956 from 33% to 19%, and its share of world trade in chemicals had fallen from 23% to 15.4%.

If, however, we looked at the markets to which the goods went the figures were more disturbing. First, if we looked at the import of chemicals by various market areas we found that the largest area of all was Continental Europe, including the UK. Europe was easily the largest export market for chemicals, taking more than one-third of the total free world chemical exports, and was also one which was expanding rapidly.

We would naturally like to see British exports going, to an increasing degree, to the industrialized countries of Europe. Unfortunately this was not the position. If we looked at chemical exports to different market areas we found British exports went to the small markets which were not expanding rapidly, *i.e.* to the British Overseas Territories and the rest of the Sterling Area, of which markets we took respectively 52.3% and 46.7% in 1957.

The proportions of these markets satisfied by the US and West Germany were far smaller. On the other hand, whereas we supplied only 10.7% of Europe's imports of chemicals, West Germany supplied 26.2%, and the US 19.8%.

Sterling Areas

After commenting on the US and Canada as markets, Mr Chambers discussed the UK's main markets, the two overseas sterling areas. There were several reasons, he said, why these areas were not expanding their intake of chemicals at the same rate as the more industrialized countries. For one thing, they were mostly producers of primary products such as wool and non-ferrous metals, the world prices of which were liable to violent fluctuations with balance of payment difficulties following sharp falls in price leading in turn to restrictions on imports.

The most satisfactory market for British goods, in his opinion, was Western Europe. Trade between industrialized countries such as Britain and West Germany, for example, tended to be more evenly balanced in the sense that it was less likely to be affected by the fortunes of particular products, or balance of payments crisis, or sudden changes of policy. It was advantageous to exchange intermediate products for further processing or for use in other industries, and to do this with a wide and complex range of products, particularly many chemical products, so that each country has the benefit of the latest and best materials for use in its final fabricating industries.

Unfortunately, over trade with Western Europe there hung the shadow of the European Economic Community with Britain on the outside of what might become a steadily growing tariff wall.

If, however, because of developments in Europe and tariff policy in North America, we were thrown back on the sterling area as our main market, he feared that there were some further troubles in prospect. Mr Chambers then referred to the growing competition from countries behind the Iron Curtain. It was his belief that in the years to come far more attention would have to be paid to competition from Russia and China than hitherto.

Russia and China

More recently the quantities of chemicals coming from Russia and China had been growing and the areas to which they went were of special importance to the British chemical industry. It was countries like India and South Africa which were particularly good targets for the sale of chemicals from behind the Iron Curtain. Those countries could not be expected to erect obstacles to the import of low-priced chemicals from Iron Curtain countries for the benefit of British industry. In this respect our markets were more vulnerable than the internal markets of the United States' manufacturers, or the Continental European markets of Western Germany.

The picture might appear to be gloomy and the outlook depressing. There were, however, other factors which might emerge. Neither in Russia nor China could the process of industrialization go on indefinitely without substantial increases in the standards of living in those countries. We might, therefore, see an upsurge of imports of chemicals into Russia and China balancing or more than balancing exports of chemicals from these countries.

As one would expect, trade in some classes of chemicals was expanding at a greater rate than trade in others. The expansion in plastics, for example, had been at a much greater rate than that in inorganic chemicals or explosives. If the pattern of chemical exports from the United Kingdom were compared with that for the world as a whole, some comfort could be derived from the fact that plastics represented a larger proportion of our chemical exports than it did for the world as a whole.

Mr Chambers went on to discuss UK exports of nitrogenous fertilizers and to outline the position of dyestuffs manufacture and pharmaceuticals.

If the present pattern of our exports required a good deal of study for any understanding of what was happening, forecasting of the pattern of our exports in the future was still more difficult.

Overall Expansion

What must be looked for was a steady expansion of British exports as a whole, with chemicals making their appropriate contribution, either as a material in other exports or as direct exports themselves. Insofar as we had been depending too much on the overseas sterling area for our markets, it would be a good sign if in the future we could see a larger proportion going to miscellaneous markets where the problems and hazards were different from those of the overseas sterling area.

In particular, we should aim, if possible, at a substantial expansion of exports to countries behind the Iron Curtain because of the growing needs of their capital and consumption industries; and increased exports to all those miscellaneous markets which lay outside the US, Western Europe and the sterling area, which in total could become important and could provide a good insurance against the hazards in the major markets to which at present we were inclined to devote most attention, but which for some chemicals might be declining or might disappear altogether.

Market area	% Share of total exports to each market		
	UK	USA	W. Germany
Cont. OEEC plus UK	15.9	28.2	27.1
North America	4.3	70.1	6.3
Latin America	8.2	54.6	11.5
British overseas' territories	44.0	8.7	15.4
Other Sterling Area	57.3	16.9	11.2
Soviet Eastern Europe	7.9	—	41.5
Rest of world	10.7	51.4	12.3
Total	18.4	37.2	18.7

UK, USA and W. German share of world plastics exports, 1956 market analysis. One of the 15 tables which illustrated Mr Chambers's lecture.

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Zinc Oxide Rubber Mixes

ELECTRICAL PROPERTIES OF HIGH POLYMERS—6

THE last lecture of this special evening course was given at the National College of Rubber Technology on Wednesday February 11. The topic of the lecture was 'Electrical Properties of Zinc Oxide Rubber Mixes.' The paper was read by Dr N. H. Langton; it had been written by Dr Langton and Mr D. Matthews, FNCRT, but the latter was unable to be present.

The lecturer commenced by explaining that the paper contained a record of research done at the National College over the last three years. The results of the work were still somewhat inconclusive, but some of the results were of interest and the methods used could be extended to other fields. In general, the lecture was a description of an investigation into the effects of the state of dispersion of various loadings of zinc oxide particles upon the physical properties of the rubber mix. It was hoped that some correlation would be found between the state of dispersion and a physical property of the mix, so that a simple method of assessing state of dispersion could be developed.

Dielectric Properties

The dispersions of the ZnO particles were examined with an electron microscope, and the types of distribution characterized by a statistical analysis of the particle counts. It was decided that the usual physical tests were not reproducible enough for this problem, and so an investigation was started to look for a correlation between the dielectric properties of the mixes and the states of dispersion. Dielectric properties could be measured accurately with fairly simple and cheap equipment, so that this method would be convenient from the practical point of view if a correlation could be established.

Another method of approach was to use an equation to calculate the permittivity of the mix from the permittivity and proportions of the components, and to compare the calculated value with that found by experiment. It was possible that discrepancies between the two values could be correlated with state of dispersion.

The lecturer started his detailed description of the work by explaining how dispersions of ZnO in rubber were examined. Three types of ZnO were used, these were (a) colloidal, of average particle diameter 0.085μ, (b) chemically pure, of average particle diameter 0.274μ, and (c) acicular, of average diameter 0.845μ, these being the manufacturer's figures. Electron-micrographs of these oxides were shown. The technique was to cut thin sections of the mix on an ultramicrotome using a glass knife, photograph the dispersion and then perform a statistical analysis of the particle counts. The actual particle distribution was then plotted, and compared with the Binomial, Poisson and Gaussian curves. It appeared that the particles were distributed according to the Gaussian curve when the dispersion was good. One of the difficulties encountered was that of obtaining a poor distribution of ZnO in rubber, and not enough of these were examined to obtain any statistical figure of merit to characterize them accurately. Electron-micrographs of sections, and pictures of the distribution curves, were shown by the lecturer.

The next difficulty met with in this work was concerned with the calculations of the permittivity of the mixes. When the literature was searched for values of the permittivity of ZnO, values ranging from 3.0 to 36 could be discovered. The type of ZnO to which the measurements was related was never given, and often the frequency of measurement was also omitted. For these reasons the authors had to make their own measurements. The only satisfactory method for measuring the permittivity of a powder was to use the method of mixtures, in which a liquid was found which showed no change of permittivity on the addition of the powder. When this was the case, the permittivity of the liquid was the same as that of the powder.

The suspending liquid was obtained by finding two liquids which were miscible, one with a permittivity less than that of the powder, the other with one greater than that of the powder. Thus a number of solutions could be made up whose permittivities straddled that to be measured. The liquids were put into a cylindrical condenser, and the effect on adding a small amount of the powder was noted. By plotting the change of capacity against the permittivity of the suspending liquid, the solution proportions which give a liquid whose permittivity was unaffected by the powder could be found. The liquids used for the ZnO permittivity determinations were ethyl acetate and cyclohexanol. The results of these measurements gave the permittivities of ZnO over a range of frequencies. One interesting point brought out was that the permittivities of the colloidal or chemically pure oxides was about 10, whilst that of the acicular was too high to be measured, being probably over 40. This indicated useful possibilities in the field of dielectric heating.

Permittivity Calculation

The next topic considered by the lecturer was the question of calculating the permittivity of a rubber-zinc oxide mix from the compounding formula. The equations of Lichteneker, Maxwell, Weiner and Bruggeman were mentioned, and graphs showing the calculated and experimental values were shown for each equation. Lichteneker's equation gave fair agreement for low volume loadings of ZnO, but deviations between the experimental and calculated results could not be correlated with degree of dispersion because it was not known to what type of particle distribution the equation applied. Maxwell's equation was concerned with a formal lattice point dispersion of the particles, and was not considered separately as it was a special case of Weiner's equation, which differed from Maxwell's only in the incorporation of a form factor F. The nature of F was obscure, but it was a function of the particle shape, and the weakness of this equation lay in the difficulty of giving F a value. Attempts to find F by experiment were not very successful.

Bruggeman's equation gave satisfactory results, but unfortunately it was a cubic equation in terms of the mix permittivity, and so the equation had to be used to compare the calculated volume loading of ZnO with that actually used. For good dispersions the agreement was satisfactory, but bad dispersions had not yet been tried. Because of the inherent experimental error in the Q-meter used for the permittivity measurements, all that could be said at this stage was that there was a slight indication that deviations between the calculated and experimental permittivities could be correlated with state of dispersion, but further work was required before a definite conclusion could be arrived at.

The lecturer concluded by showing some experimental results obtained with a dielectric heater which illustrated the high heat factor that could be obtained by the use of acicular ZnO.

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Plastics Convention

IN CONJUNCTION WITH OLYMPIA EXHIBITION

SIXTEEN papers are to be presented at the international plastics convention, held in conjunction with this year's International Plastics Exhibition at Olympia, London, June 17–27.

Within the general theme of 'Developing Fields,' the papers fall under the headings of Polyolefins, Material Developments, Design Trends, Recent Developments in Glass Reinforced Plastics, Expanded Plastics and Extrusion. Time is to be allowed after each for questions and open-forum discussion.

The sessions, including papers by overseas speakers representing Holland, Denmark, Italy, Germany and the U.S., will be spread over three days, June 22, 23 and 24. The convention programme is as follows:

Monday June 22.

10.30 a.m. Polyolefins:
'Mechanical and physical properties of polypropylene,' by J. M. Goppel, Shell Laboratories, Amsterdam, Holland.
'The moulding characteristics of polypropylene,' by G. Campbell, Plastics Division, Imperial Chemical Industries Ltd.

2.30 p.m. Material Developments:
'Some new amine hardened epoxide resin systems and their properties,' by R. N. Lewis, Bakelite Ltd.
'Cross-linking of thermoplastics after fabrication,' by R. R. Smith, BX Plastics Ltd.
'Some theoretical and experimental aspects of block and graft copolymers,' by J. Benton and C. M. Thomas, British Geon Ltd.

Tuesday June 23.

10.30 a.m. Design Trends:
In the United Kingdom, by Robin Day.
In Scandinavia, by Count Sigvard Bernadotte.
In Italy, by Ernesto Rogers.

2.30 p.m. Recent Developments in Glass Reinforced Plastics:
In Benelux countries, by Roelf Tunteler, Plastics Research Institute TNO, Holland.
In Germany, by H. Kraft, Chemische Werke Huls A.G., Germany.
In the United Kingdom, by Brian Parkyn, Scott Bader and Co. Ltd.
In the United States, by Owens-Corning Fiberglas Corp., USA.

Wednesday June 24.

10.30 a.m. Expanded Plastics:
'Recent developments in foamed plastics in the USA,' by Betty Lou Raskin, the Johns Hopkins University, USA.
'Expanded polystyrene: Influence of bulk density upon physical properties,' by W. B. Brown, Monsanto Chemicals Ltd.

2.30 p.m. Extrusion:
'Extrusion studies on thermoplastics,' by D. A. Lannon and G. C. Karas, British Resin Products Ltd.
'The extrusion of acrylics,' by L. Griffiths, Plastics Division, Imperial Chemical Industries Ltd.

Trans-Chemicals Ltd.

Mr William Johnston, formerly with Imperial Chemical Industries Ltd., has been appointed a director of Trans-Chemicals Ltd., a member of the Commercial Plastics group of companies. His office will be at 75 Grosvenor Street, London, W.1 (Tel.: Hyde Park 9261). The principal function of Trans-Chemicals Ltd. will be the buying of the major raw materials of the group, and buying on behalf of Paz Chemicals Ltd. (formerly Shell Chemicals Distributing Co. (Middle East) Ltd.).

Mr William A. Woodcock has been appointed vice-president and general sales manager, chemicals and plastics, of the Union Carbide International Co.

Du Pont Settlement with Russia

THE Soviet Union has reached a settlement with E. I. du Pont de Nemours and Co. over a long-standing claim for a million and a half dollars. The announcement of the settlement—by the payment of the money to the firm—was made by Mr V. S. Alkhimov, Commercial Counsellor of the Soviet Embassy in Washington, who has been in New York. He signed the agreement with representatives at Wilmington, Delaware, last Friday, he disclosed. He added that the settlement had been made to 'clear the decks' for the exploration of extensive trade possibilities between the US firm and the Soviet Union.

The du Pont claim arose from a wartime arrangement under which the firm supplied to Russia technical information on the commercial production of Neoprene synthetic rubber. The information was given in the expectation that a United States producer would supply the Soviet Union with a plant for synthetic rubber production. This arrangement had the general approval of the United States Government, but when the Soviet Union applied in 1947 for permission to obtain the plant, it was refused under the trade restrictions invoked by the US Government.

Du Pont then filed a claim for payment in 1955. It was for what Mr Alkhimov described as a 'substantially larger' sum than the one which was finally agreed on. Mr Alkhimov said the settlement was in full payment of Soviet obligations for technical information.

Miles Appointment

Miles Structural Plastics Ltd. announce that Mr B. T. Scott, until recently sales engineer with Kestner Evaporator and Engineering Co. Ltd., has now joined Miles Structural Plastics Ltd. as sales development engineer. Miles are currently expanding their production capacity in both the asbestos/phenolic and glass-fibre fields, and are developing applications of structural plastics, hitherto unconsidered on grounds of size or quantity.

Mr Adrian Jacobs has been appointed a director and chairman of Garing Estates, formerly the Garing (Malacca) Rubber Estate. Mr Neil Rose and Mr Joseph Spence have also been appointed to the board. Major-General A. H. Gatehouse, the previous chairman, Mr F. A. Jacob and Mr D. M. Sarsfield have resigned as directors.

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VIEWS and REVIEWS

Arthur Hantzsch

IN an appreciation of the work and personality of Arthur Rudolph Hantzsch in the January 1959 issue of the *Proceedings of the Chemical Society* (p. 1 to 4) Professor T. S. Moore has brought together, in his opening sentences, three personalities, all, in various ways, well known or celebrated in the history of chemical science, but also—and this is the actual point of the present note—individuals who were personally well known to the writer of this note. To be precise, and in order of sequence, J. T. Hewitt, Arthur Hantzsch, and A. Werner.

The quotation from Prof. Moore reads:

'"When I get a new Berichte I turn up Hantzsch's papers first." So said the late Professor J. T. Hewitt to me, and I have no doubt that many chemists in the early years of the century could have said the same, for by then Hantzsch had established a unique position. His success, with Werner, in solving the problem of the isomerism of oximes and so opening a new field of stereo-chemistry, followed by his elucidation of the heavy complex of problems offered by the di-azo compounds, showed such mastery that anything he wrote afterwards must have been received as important.'

However, for those directly interested in Hantzsch's labours—he published some 450 'papers'—and in his work with Werner, and how he broke away from conventional beliefs, and from 'static constitutional formulae' as Prof Moore puts it; how he was the 'first prominent chemist to devote himself to the problems involved . . . ,' and how he 'looked at chemistry from a new angle,' I can refer with confidence to the article in the *Chem. Soc. Proceedings*. My purpose is only to record a few personal impressions of the actors in those now distant scenes.

Austerity and Immaturity

Prof Moore obviously knew Hantzsch at a somewhat later date than the writer, but I can broadly confirm the view that 'Informal and friendly as he was to his students, he was not as a rule able to bridge the gulf between his own austere and highly-developed personality and our immaturity.' I should feel inclined to add the qualification that his reserve was not far from austerity or even taciturnity, but there was nothing in this of a sense of superiority, whether intellectual or sociological. For example:

To the best of my memory at the entrance examination to the Federal Polytechnica in Zürich, whence I had betaken myself from University College School (then in Gower Street), or possibly at the first 'Colloquium,' a discussion as to H_2SO_4's structure or classification arose. Hantzsch several times (if my memory is correct) spoke of 'sulphuric acid,' and with the temerity of 'immaturity' (the word is Prof Moore's!), or, possibly, an absence of shyness (which sometimes characterizes extreme youth) I observed that I had been told (by my dear old chemistry master in Gower Street) that H_2SO_4 was 'Hydrogen sulphate.' Now, as it happened, this was, of course, right up Hantzsch's street—to put it colloquially—and he might well have called me over the coals for such presumption, but he only remarked, without any special emphasis, 'Well, I don't agree with you.'

Werner

I have a vivid recollection of A. Werner. My memory of him is of a personality the very antithesis of Hantzsch. A good 'mixer,' friendly, a 'Korps' student (unless my memory is playing undue tricks), and yet—as his published work and his association with Hantzsch show—a man with a first-class brain, and of which he made good use. One might, possibly, if one wished to evoke a suitable comparison, conjure up in connexion with the joint Hantzsch/Werner researches, an intellectual association between John Knox and Dartagnan.

Hewitt

Professor Moore has also brought into the picture a very good friend of mine, Professor John Theodore Hewitt, who passed away comparatively recently. Hewitt was for a number of years Professor of Chemistry at East London, but my first memory of him is that of his being much occupied in his spare time with the investigation of a chemical process designed to hasten the maturation of potable spirits. However, to this day, what one may call 'natural' methods still defy any competition of science or synthesis and Hewitt's niche in the hall of scientific fame must rest on his work on education and his published scientific researches. As a man he was interested in many matters, and anything but a 'dry-as-dust' scientist, as I am sure Prof Moore will agree.

I can cordially recommend Professor Moore's fine study of Hantzsch and his work to all chemists interested in the history of science as well as of its achievements.

I.C.I.'s Safety Film

To my recent remarks on industrial accidents particularly on those in the rubber industry, it gives me satisfaction to be able to record a most useful contribution on the subject as discussed in an account of 'I.C.I.'s New Safety Film' as recorded in a recent issue of *Chemistry and Industry* (January 31 1959, p. 169). This latest film made by the I.C.I. Film Unit, and directed by Pat Morton, bears the title of 'The Human Factor.' It is in colour (with sound), and available on both 35mm. and 16mm. film. 'The narrator of the plain but thoroughly effective commentary was Maurice Denham.'

The camera shows the various causes of a specific industrial accident, analysing the various contributing factors. This is well achieved by giving in succession the views which each man involved obtained of the accident. In this way the event is clearly depicted as one of the characters says, 'by a number of different circumstances

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **DR SCHIDROWITZ**

all happening at once.' Several people, the *C and I* account says, bear responsibility, several are to blame.

The Human Factor

As I have, from time to time, tried to emphasize, 'It is so often the case that the human factor is the crucial one.' The film stresses this point 'and then proceeds to show how objective thinking and honest talking after an accident can do a great deal to reduce further hazards.'

Loan of Film

A generous offer is made by I.C.I. as expressed in the final paragraph of the *Chemistry and Industry* report:

'It is hoped that the film will also prove of value to other industrial organizations. Copies may be borrowed from I.C.I. sales offices or direct from the I.C.I. Film Library, Imperial Chemical House, Millbank, London, S.W.1.'

SCI Annual Meeting

In accordance with a Preliminary Announcement made by Dr John A. Cranston, the Executive Secretary of the Annual General Meeting (c/o Society of Chemical Industry, 14 Belgrave Square, London, S.W.1), the 78th Annual General Meeting, at the invitation of the Glasgow Section, will take place in Glasgow during the period July 6-11 1959. I should have called attention to this matter some little while ago, but, unfortuntely, Dr Cranston's 'Business Reply Card' asking members to reply to a brief questionnaire as to their wishes on several important points (such as whether they propose to attend; arrangements as to accommodation, guests, etc.) went temporarily astray.

Plastics Standards

The editorial in the January 1959 issue of *Modern Plastics* bears the heading 'Standards are Everybody's Business.'

I think this view is as applicable to those connected with the trade in this country as well as in US, and for that reason a few words based on Mr McCann's remarks may be of interest.

Modern Plastics was referring particularly to a speech made at the 9th National Conference on Standards by Alfred C. Webber (Du Pont Polychemicals Dept.), Chairman of Committee E—1, and Vice-Chairman of Committee D-20, ASTM, and a member of the US delegation to the International Standards Organization, Technical Committee 61 on Plastics. It appears that Mr Webber made some cogent remarks concerning the participation of moulders and users in standards committee work. Thus, he said:

'Here we have an industry that in 1938 produced 11 different materials in a quantity of 150 million lb., and in 1958 produced 29 main types of materials in a quantity of 4.4 billion (*i.e.* 4.4 *thousand million*) lb. With approximately 180 producers of raw materials that become plastics, with nearly 3,000 processors—both captive and custom—the matter of specification is of primary importance, particularly since the trend is towards combining materials in plastics alloys and copolymers.'

Specification Committees

The composition and methods of work of specification committees in US doubtless differ in some respects from those obtaining here, and, therefore, ASTM 'firm rules' should be of interest. It appears that no committee of less than six men can write a 'materials' specification. In each such committee at least half the personnel must be consumers—*i.e.* moulders, end-users, etc., plus 'general interest people such as university staff members. The rest of such a committee may be representatives from material-making concerns.'

Numbers of Tests and Standards

There are now, *Modern Plastics* mentions, 125 established test methods and 44 specifications for plastics in the United States. Internationally, through ISO, 29 standards have been adopted by the committee, and six more are ready for balloting. Agreement has been reached on 800 specific terms in six languages.

Increased Business Through Standards

Much in the way of savings and the promotion of increased business are, it is held, to be obtained through plastics standards. Thus, inventories will be less heterogeneous, and premium prices should be obtained for 'quality above industry tolerance specifications.' Moreover, 'Communication between production management, sales management, and the customer will be made easier. The invasion of new fields, such as the construction field, by plastics, will be speeded up.'

PHILIP SCHIDROWITZ

World's Heaviest Sea Pipeline

An interesting feature of what is claimed to be the world's heaviest sea pipeline, to be laid in the Gulf of Guinea, is its exterior coating, which is of several layers of glass fibre and bitumen.

The pipeline, which has total deadweight of about 2,000 tons, and is over a mile long, is to be laid by Taylor Woodrow (Ghana) Ltd., in association with Collins (Overseas) Ltd. The contract, placed by the Ghana Government's Tema Development Corporation (the pipeline will form a sewer outfall from Tema), is in the region of half a million pounds. The work, which starts this month and will take approximately six months to complete, will involve welding together the short lengths of the pipe (from Stewarts and Lloyds Ltd.), into one continuous length, protecting the inside and outside pipe surfaces and towing it out to sea. The exterior will be coated with several layers of glass fibre and bitumen, individually applied by special machines. Finally the pipe will be encased with concrete, varying in thickness between 4in. and 6in., which will stabilize the pipe on the sea bed as well as affording additional protection. The overall diameter will then be just over 3ft. at the smallest section and 41½in. at the other points.

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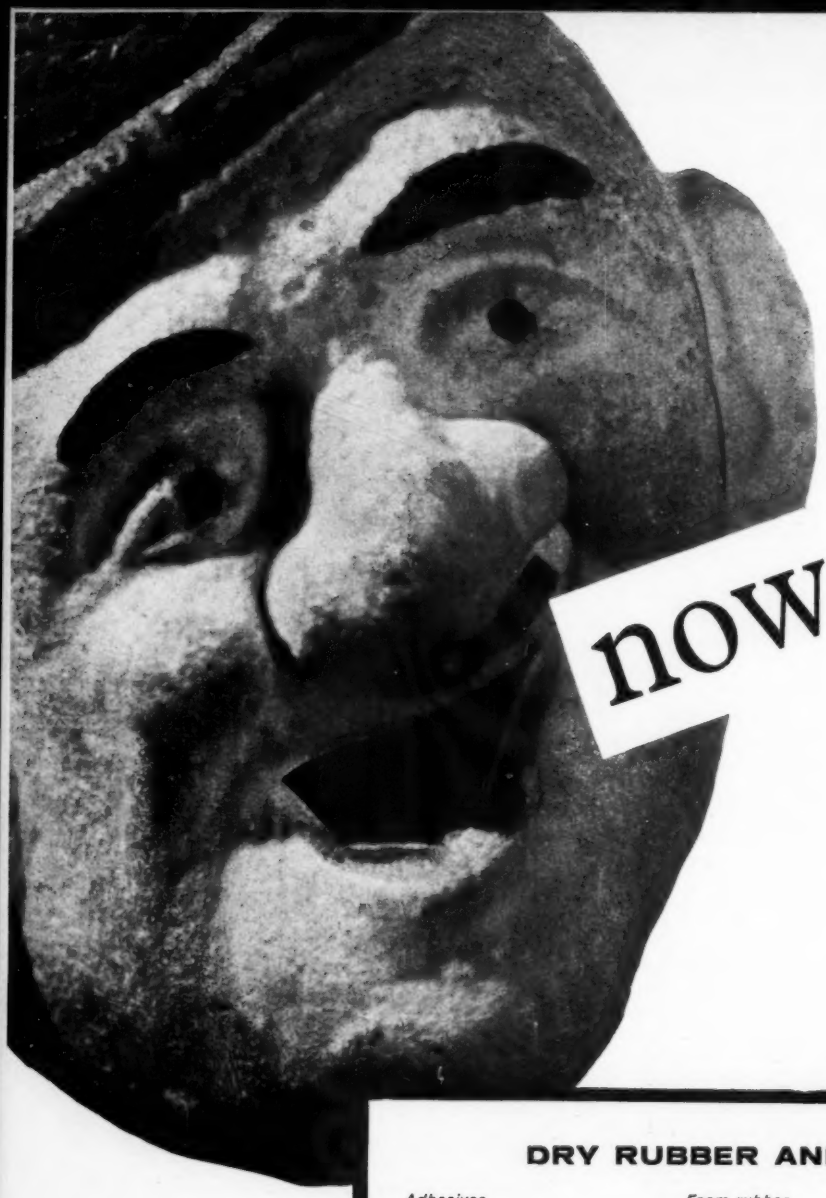

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Questions Corner—63

(Second Series)

271. What are the factors that require consideration when selecting a colouring material for use in PVC paste formulations?

272. What are the characteristics of paste making polyvinyl chloride polymers?

273. What are the chief considerations that should be given in the formulation of an emulsion paint?

274. How would you identify nylon yarn?

(Answers next week)

Answers to Questions Corner—62

267. Basically there are seven methods which are used for vacuum forming of cellulosic film or sheet, but variations within these methods are also used.

Essentially the methods consist of the following: a. Straight forming in which the sheet is clamped in a frame, heated and then vacuum drawn into the mould. b. Drape forming where the sheet is clamped into a frame which is moved over a male mould before vacuum is applied. c. Mould above sheet. In this case the mould is placed above the sheet, which is fixed into a frame, and heated. The mould is then lowered and partially forms the sheet before vacuum is applied. d. Pressure forming. The sheet is placed in a frame, heated and then formed between matched male and female dies. e. Snap-back forming. The sheet is heated and a vacuum applied pulling the sheet into a cavity. A male die moves downward until it reaches a predetermined position when a vacuum is applied in the male die. f. Ring and plug forming where the heated sheet is placed over a ring and clamped down. The mould, mounted on to a ram, is forced into the sheet. g. Air pressure forming. A heated sheet is placed over a female mould and a cored plug pushes the sheet into it. Air pressure is then introduced into the plug thus pressing the sheet into the female mould. Holes in the mould allow the air to escape.

268. There are several factors which can affect the stability of polyvinyl acetate emulsions, but generally commercial products are stable under normal temperature conditions while in store, and with sufficient care for certain basic principles should cause little trouble in processing. There may be slight settling of the resin during storage as its specific gravity is greater than that of water, but this settling is only pronounced when the particles are coarse in size. The addition of strong hydrophilic substances may cause instability, *e.g.* ketones and other water miscible solvents for the resin.

Polyvinyl acetate emulsions are, of course, liable to be damaged by freezing and thawing, but the damage will vary according to the type of emulsion, type and quantity of the protective colloids used, the emulsifying agents, particle size, molecular weight and the degree of plasticization. When a polyvinyl acetate emulsion suffers severe mechanical treatment it may become less stable, and those of fine particle size are more liable to this trouble than those of a coarser particle size. Care must be taken in compounding particularly when there is a high filler content.

The mechanism of stabilization is essentially electrical and therefore the addition of anionic agents to positive emulsions, or of cationic agents to negative emulsions will cause instability, unless under careful control. Provided steps are taken to prevent any evaporation polyvinyl acetate emulsions can be heated for short periods nearly to boiling point.

269. The main functions of the use of fillers in the formulation of PVC pastes are: 1. To reduce the cost. 2. To alter the flow properties. 3. To produce a matt surface.

The use of a large percentage of filler in a PVC paste is generally undesirable as any filler will absorb plasticizer and thus increase the viscosity. This may be avoided to some extent by using high viscosity plasticizers or by using a filler with a low oil absorption. The oil absorption value is determined and expressed as the weight of oil absorbed by 100 parts of filler. The greater the oil absorption value the greater the increase in the viscosity of the paste.

It is generally considered that for low oil absorption the filler particles should be roughly spherical and have a certain particle size distribution. Approximate oil absorption values for some fillers are: China clay—medium fine, 35; china clay—very fine, 55; calcium carbonate, 36; silica, 42; water ground mica, 79.

The filler content can be increased without affecting the viscosity of the paste to any appreciable extent by increasing the plasticizer content by appropriate amounts according to the oil absorption value of the particular filler used. However, as the filler content is increased the physical properties of the final film will be reduced. Fillers, of course, should be finely ground, but there is a minimum size below which it is inadvisable to go, otherwise the viscosity of the paste will be affected to an undesirable extent, *e.g.* china clay with the majority of the particles smaller than 1μ would give a very viscous paste.

270. It is well appreciated that all ingredients must be well dispersed when compounding polyvinyl chloride and especially those materials which are only used in small amounts. Without complete and even dispersion of stabilizers there will be variable stabilizing efficiency throughout the compound. This may be seen as local zones of degradation where severe service conditions are encountered.

The practice of predispensing the stabilizer before adding to the resin is essential to ensure uniform dispersion. In some cases the total plasticizer required is used to thin out the stabilizer still further so that it may be sprayed into the mixer. It should be noted that the time required for efficient mixing is also reduced by the use of dispersions and, as an important consequence, the compound is not kept at a high processing temperature so long. Another fault that may occasionally be encountered is the appearance of visible specks on the surface of the finished product. This is merely one case of really bad dispersion and it can be eliminated by the use of dispersed stabilizers.

Many stabilizers, when in dry powder form, agglomerate during transit and are not easy to disperse when once formed. This can be obviously avoided by the use of stabilizers dispersed by the manufacturer. If the user decides to make his own stabilizer-plasticizer dispersion he can do so by using a paint grinding mill, but he still has the problem of dust during handling. This is of some importance as in some cases there is a definite health hazard.

Stabilizer manufacturers supply their products dispersed in DOP or DBP unless others are requested, in such ratios that while they will easily mix with the polyvinyl chloride they will not appreciably settle in storage.

(More questions next week)

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MEN and MATTERS

A Review of People and Events

by George A. Greenwood

THIS year's Ideal Home Exhibition at Olympia is certainly a most impressive affair, which cannot be covered in one visit. Even so, I saw a great many things of interest to, and from, our industries.

Although the British Pavilion from the Brussels Exhibition dominates the show, it has to share the honours with Britannia Mews, the village of ideal homes. Here there are three-bedroomed houses and flats which require no external painting or maintenance simply by reason of the long-awaited and ingenious use of hardwearing plastics materials for guttering, window frames, and plastic-faced doors. Some features of this development are quite fascinating. For example, the wooden window frames are completely encased in plastic. They are made with nylon hinges which cannot corrode or jam, and need no lubricating. They are so designed (the windows) that both sides of the glass can be cleaned from the inside, and some of the ladies who were in the party when I went round, were exclaiming 'Oo-oo-h!'

Hard cedar-wood frames, faced on the outside with laminated plastic, are particularly attractive, and were receiving a lot of attention, and plastic guttering 12in. wide—said to be wide enough to stand any storm — has a metal rail above it to take the weight of ladders for roof repairs.

But if you go to Olympia you must not, repeat *not,* miss the gardens. This year they are the finest in the Exhibition's history.

Truly Indivisible

Mr Molotoff was too right, as the Australians say, when he declared that peace is indivisible, and he could have said the same thing about trade and commerce. I have been greatly interested in looking through the statement from Sir Graham Hayman which reached me with the report and accounts of BTR Industries Ltd in preparation for the annual meeting on March 25. Sir Graham points out what this vast undertaking does in the way of supplying rubber and so on to other industries, and explains the drop of some 30% in trading profit, down to £1,003,052, by reduced demand. He says that the most significant factor to account for the reduced profit is the contraction in orders for conveyor belting especially in the coal-mining industry.

It was apparently the same in the company's traditional markets in the general industrial field, although there seems a likelihood that the reversal of the Government's financial policy will be an effective adjustment, sooner or later in that direction. During the past year the company's new factory at Farington has been completed, 'and,' Sir Graham adds, 'we are now able to provide accelerated service in the supply of roller coverings for the steel, paper pulp, printing, dyeing and bleaching industries, and to offer similar prompt service to users of rubber, ebonite and plastic materials such as PVC and PTFE as protective coatings and linings.'

Sir Graham also reports progress in the manufacture of rigid PVC pipes, fittings, and valves, and has something very interesting to add about the Russian demands which BTR are supplying in face of severe competition from other countries.

Sir William Garrett

The many friends in the chemicals and plastics industries will be interested in what happened at the recent annual meeting of the British Employers Confederation. Viscount Weir, the shipowner, was re-elected honorary president; Sir William Garrett, president; and Lord McCorquodale of Newton and Mr E. J. Hunter, are again vice-presidents.

Sir William, knighted only a year or so ago, and in spite of his many other commitments, has been spending a lot of his time and talents in attending to the affairs of the Confederation, which has been very busy during the past year or two, particularly with negotiations with the Government and with the TUC and so on, over matters of hours, wages, the Common Market and the question of setting up a Free Trade Area. He is one of the Confederation's representatives on the Ministry of Labour's National Joint Advisory Council, and on the Joint Consultative Committee, as well as on the Chancellor of the Exchequer's National Production Advisory Council on Industry. These activities, together with his directorship of Monsanto Chemicals, Metal Industries, and the Scottish Lowland Trust, together with his post as a life president of the Association of Chemical and Allied Employers, are sufficient to ensure that Sir William's time is fully occupied.

History in Tyres

An interesting piece of news comes from the Dunlop factory of Melbourne. There techniques of hand craftsmen of 60 years ago were recently revived by skilled workmen when they created a special set of tyres for the buggy-type wheels of Australia's oldest car.

Two pairs of tyres, 34in. (front) and 44in. (rear) in diameter, were required to fit the wheels of a reconstructed steam phaeton built in Melbourne by Herbert Thompson in 1896. The tyre casings were constructed on special wooden formers, from two-ply, bias-cut rayon cord fabric, and copper-plated steel beadwire. After these had been painted with special heat-curing cement and dried, a pre-shaped tread was affixed to them, and they were then hand-shaped around a solid rubber core prior to vulcanization in a steam pressure bath.

Modern techniques of tyre construction were used only when necessary, and for the improvement of strength over the originals.

Postscript

A last-minute postscript to what has gone before in the matter of appointments. Mr D. A. MacDonald has been elected Vice-President of the International Latex Corporation of the USA, and appointed general manager of the UK Division. Mr MacDonald, a Britisher, has been controller and general manager of the Playtex manufacturing operation. His new appointment accords with the Corporation's policy that the British Division should be managed by a British executive.

Mr Iain M. Stewart, chairman and managing director of Thermotank, and Mr John H. Lord, a director of the Dunlop Rubber Company, have been appointed directors of G. and J. Weir Holdings. The word 'holdings' was added to the company's name at the end of last year. Mr Lord's retirement as a managing director of Dunlop Rubber was reported on January 1.

I.C.I. at OCCA and EEE

A VARIETY OF NEW PRODUCTS

THREE I.C.I. Divisions—Dyestuffs, Heavy Organic Chemicals and Nobel—share a stand at this year's Oil and Colour Chemists' Association Exhibition to be held at the New Horticultural Hall, March 17–19.

The Dyestuffs Division display will illustrate a number of new dyestuffs, pigments and resins for the paints, plastics and allied trades. The non-flocculating properties of Monastral Fast Blue RFS, a new pigment, will be demonstrated in comparison with existing phthalocyanine pigments. A range of chrome pigments will also be seen, illustrated as paints and printing inks, to demonstrate their outstanding light fastness and durability. Included will be Monolite Fast Violet RS, a new pigment characterized by its very high light fastness and attractive shade at low concentration; Modulac 147W, a new resin for use in glossy thixotropic paints, and two new products—3X and 5X—in the 'Bedacryl' range of vinylated alkyds.

The Nobel Division is to show new and improved silicone resins for heat resistant paints which will illustrate the effect of prolonged heating at high temperatures on silicone and conventional paints. Two development products, trimethylol propane and neopentyl glycol, will also be seen. Trimethylol propane is used in the preparation of short-oil alkyd resins for stoving enamels, while neopentyl glycol is used in the production of esters, polyester resins and plasticizers.

The main feature of the Heavy Organic Chemicals Division exhibit is high-purity terbutol (*p-tert*butylphenol), being demonstrated for the first time at this year's exhibition (it is used as an intermediate in the manufacture of reactive and non-reactive varnish resins) and also covers octylphenol, another resin intermediate, and a range of solvents for use by the surface coating industry.

At the Electrical Engineers' Exhibition, Earls Court, London, March 17–21, I.C.I. will be represented by three of its divisions, Metals, Nobel and Plastics.

Platinized titanium, non-consumable anodes for various electrochemical processes will be a feature of the Metals Division display, and a number of heat exchange materials will be seen.

I.C.I. silicones form the basis of the Nobel Division's exhibit. Silicone dipping and impregnating resins for motor and generator components and dry type distribution transformers will be featured, as well as silicone resins used in the production of glass cloth laminates and resins for cloth-coating and mica-bonding. On show too will be silicone rubbers and rubber pastes and moulded and extruded parts.

Theme of the Plastics Division exhibit will be 'I.C.I. Plastics for the Lighting and Electrical Industries.' A colour display of 'Perspex,' leading to a large 'Perspex' lens, will be a prominent feature. Three groups of display panels will show 'Perspex,' 'Darvic,' 'Diakon' and 'Flovic' sheet for lighting, 'Alkathene,' PVC, 'Melinex' film and 'Fluon' (PTFE) for cables and wiring; and UF moulding powder, 'Melinex,' 'Fluon' and nylon for electrical components.

Rubber Restriction Scheme

'CATASTROPHIC FOR MALAYA'

A WARNING that a rubber restriction scheme would be catastrophic for Malaya, was made at Ipoh last week by Mr H. Paterson at the annual meeting of the Central Perak Planting Association.

He said that occasionally one heard responsible people toying with the idea of rubber restriction and to them he would say: 'Natural rubber restriction would encourage the production of synthetic rubber in every consumer country in the world and thus many markets would be lost to Malaya for all time.'

Mr Paterson said 'Planting would also be encouraged in countries not covered by the restriction. For example in a previous tin restriction scheme the Belgian Congo was not restricted and thus was free to build up its tin industry and benefited accordingly.

'Red China and Russia are not members of the present tin restriction scheme and are benefiting at the expense of restricted producer countries.

'Could the Governments of member countries guarantee that a rubber restriction could be carried out? During the first rubber restriction scheme Indonesia was not a member and was thus able to receive and sell many thousands of tons of rubber which were smuggled from Malaya.'

Mr Paterson said 'before any restriction of natural rubber can be brought into being every rubber producing country from the largest producer to the smallest must join in partnership together with their Government guaranteeing that the rules and regulations of restriction could be enforced.

'A rubber restriction scheme would have to embrace thousands of smallholders in various countries who depend on rubber for their living. The lower the price of rubber the more they would have to reduce to keep up their living standards.'

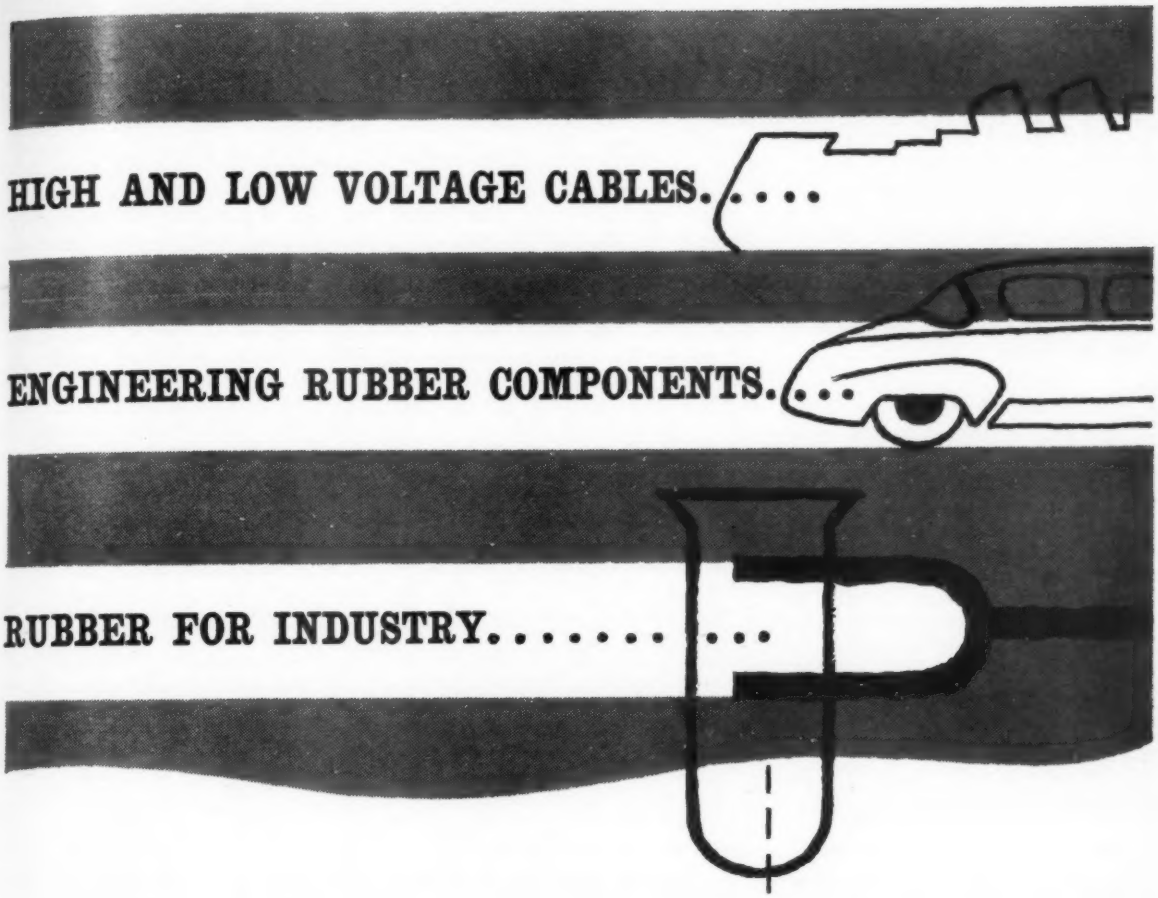
Mr Paterson said 'it would also be found that the imposition of restriction would after a short time make less money available for replanting.

'Since the whole future prosperity of the Malayan rubber industry depends on replanting with the resultant low cost of production due to higher yields it would be catastrophic to allow restriction for this reason alone.' For 'if any kind of buffer stock pool is proposed the rubber industry manufacturers would immediately cease to hold stocks of their own as the buffer stock pool does that for them.

'The buffer stock has to be sold some time and hangs on the market until it is liquidated.' Mr Paterson said 'if the price of rubber falls considerably synthetic rubber will not be able to compete with natural rubber and thus many synthetic rubber plants will close down. During periods in 1958 some synthetic plants have been running at two-thirds production, so it would be advisable to allow them to go on restricting to the extent they consider necessary. The restriction of rubber in any shape or form would benefit producers of synthetic rubber at the expense of Malaya and other rubber producing countries.'

Thin Polythene Film

The Plastics Group of The Metal Box Co. announces two new gauges of super-thin Diothene polythene film. Known as 50 and 60 gauge, they are .0005in. and .0006in. thick, and represent a considerable technical advance. In July last year Metal Box announced the launching of 75 gauge (.00075in.) Diothene film, which was claimed to be the thinnest at that time.



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OBITUARY

T. J. Cumming

Mr Thomas John Cumming, who was chairman and a director of a number of rubber plantation companies, notably those for whom Rutherford McMeekin and Co., the Ethelburga Agency, and James Warren, acted as secretaries, died in Lagos, Nigeria, on March 5. An appreciation of Mr Cumming, who was 76, will appear in next week's issue.

John Clark

Mr John Clark, who was well known in the rubber industry through his long association with the North British Rubber Co., Edinburgh, has died at the age of 77. When Mr Clark retired in December 1948 he had completed 49 years' service with North British Rubber, latterly as manager, general order and dispatch departments. It is interesting to recall that in 1921 Mr Clark was awarded a prize of £100 by the Rubber Growers' Association for suggestions for advertising the uses of rubber.

M. S. MacDonald

The death has occurred in Akron, Ohio, of Mr Merton Scott MacDonald, who was plant manager of the Goodyear Tyre and Rubber Co.'s new Scottish factory from its opening in 1957 until last October. He was 53. A native of Waterville, Maine, Mr MacDonald joined the Goodyear organization at its headquarters in Akron in 1930. He first came to this country in 1945 as divisional superintendent, responsible for tyre and tube production, at the company's Wolverhampton factory.

After six years Mr MacDonald returned to the States and spent several years in American factories studying the latest developments in tyre manufacturing processes. He returned to Great Britain in 1957 to become the first plant manager of the company's new Scottish plant. He was re-assigned to Akron last October.

Corrosion Report

The Annual Report for 1957 of the European Federation of Corrosion has now been published by the Frankfurt office of the General Secretariat of the European Federation of Corrosion. The Federation consisted of 32 societies from nine countries at the time of its formation in 1955 and by the end of 1957 the number of members had increased to 48 societies from 15 countries.

Part 1 of the report deals with the work of the Federation as such. The reports from member societies are given in Part 2, which includes a review of the activities of technical and scientific societies in Europe which include practically all branches of corrosion research.

The report may be obtained from *RJIP* Book Department (including post and packing), price 35s. (for members of affiliated societies), 70s. for non-members.

DUNLOP AT OCCA

New types of polyvinyl acetate emulsion will be shown on the Dunlop stand at the Oil and Colour Chemists' Association 11th Technical Exhibition in London on March 17 to 19, and details will be given of work carried out by Dunlop scientists on new methods of initiating polymerization.

The new Polimul 850 series of emulsions differs from conventional polyvinyl acetates, the makers claim, in having a considerably finer particle size. This causes a smoother and more complete film integration, which can be seen in the enhanced water resistance of unpigmented film. Paints made from this series are particularly durable and scrub resistant. A further advantage is that satisfactory paints may be made at higher pigment binder ratios than with normal PVA emulsions.

The Polimul 860 series, which will also be shown, has been formulated to provide very good pH stability. Use of Polimul 860 emulsions minimizes attack on containers and helps to preserve the initial physical characteristics of the paint. Both these series are available at several levels of plasticizer content to accommodate different pigmentation ratios.

A section of the stand will be devoted to illustrating new techniques of polymerization, which have been developed by the Dunlop Research Centre. In place of copolymers, graft polymers of two monomers have been developed, using chemicals (radical) initiation, photoimitation and gamma radiation. Some of the apparatus used is shown, and there is a model of the gamma ray source.

USES OF RUBBER

One of the biggest single lengths of conveyor belting ever built by the Goodyear Tyre and Rubber Co. (Gt. Britain) Ltd. was recently completed at the company's Wolverhampton plant. With a length of 1,350 ft. it weighs 11 tons. The belt, *right*, was ordered by Guest, Keen and Nettlefold Ltd., of Eastmore Works, Cardiff, for carrying iron ore. The moisture-proof car-to-trailer power coupling (*below*), made by Rist's Wires and Cables Ltd., Lower Milehouse Lane, Newcastle, Staffs., is moulded from I.C.I. silicone rubber. It was employed on the British Trans-Antarctic Expedition where its resistance to cold made its contribution a notable one

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Rubber Statistics

WORLD POSITION AT THE END OF 1958

THE Press Release recently issued by the Secretariat of the International Rubber Study Group shows the world rubber position at the close of the year. The following preliminary figures, which are expressed in 1,000 long tons, compare the position at the end of 1958 with that at the end of 1957.

NATURAL RUBBER

	Dec. 1958	Year 1958	Year 1957
Production ..	190.0	1,855.0	1,902.5
Consumption ..	187.5	1,995.0	1,887.5
		Change since Jan. 1 1958	
Stocks at December 31:			
In producing areas ..		292.5	+ 20.0
In consuming areas ..		217.5	- 40.0
Afloat		222.5	—
		732.5	- 20.0

The above table shows natural rubber production well below consumption during the year, but the Study Group points out that the Indonesian export data included in the production total are incomplete. In view of recent price trends, which have been fairly steady on the whole, it seems reasonable to conclude that production in 1958 was roughly at the same level as consumption. As may be seen from the above table, consumption exceeded the previous year's figure by some 100,000 tons or rather more than 5%, probably largely owing to the high level of Russian and Chinese buying which is referred to below. The Study Group's estimate for natural rubber consumption during 1958, issued after its meeting in Hamburg some nine months ago, was 1,915,000 tons, and has thus been exceeded by 80,000 tons.

Imports into Russia and China

The natural rubber consumption total for December includes imports into Russia of 26,500 tons and into China of 17,500 tons, making a total of 44,000 tons or rather less than one-quarter of the world consumption total for the month. Imports into Russia during the whole year totalled 209,000 tons and those into China 150,000 tons, the 1957 totals for these two countries having been 77,500 tons and 115,500 tons, respectively. The 1958 totals thus exceeded those for the previous year by 166,000 tons, and throw into relief the extent to which, during the past year, prosperity in the natural rubber producing industry may have been dependent on the product continuing to find favour in these two countries. The 1958 combined total of 359,000 tons for these two countries represented nearly one-fifth of world consumption during the year.

Synthetic Rubber

The synthetic rubber position during 1958, as compared with the 1957 figures, is set out in the following table:

SYNTHETIC RUBBER

	Dec. 1958	Year 1958	Year 1957
Production ..	117.5	1,210.0	1,262.0
Consumption ..	115.0	1,225.0	1,257.5
		Change since Jan. 1 1958	
Stocks at December 31 ..		255.0	- 12.5

In the case of synthetic, the totals for both production and consumption have remained considerably below those for 1957. The Study Group estimated that 1,237,000 tons of synthetic rubber would be produced to meet requirements outside the Communist area, and the above figures are confirmation of the reasonable accuracy of this estimate.

United States General Position

The United States Department of Commerce has issued the following preliminary statistics for the month of December:

NATURAL RUBBER

Consumption:
46,963 tons, of which latex 6,820 tons
Stocks:
77,807 tons, of which latex 8,900 tons

SYNTHETIC RUBBER

	Production	Consumption	Stocks
S-Type ..	85,270	71,290	143,533
Butyl ..	3,933	4,897	18,770
Neoprene ..	9,201	6,701	15,488
N-Type ..	3,217	2,540	7,292
	101,621	85,428	185,083

Total new rubber consumption during December amounted to 132,391 tons and brought US consumption to the end of the year for both natural and synthetic combined to 1,357,404 tons, of which natural accounted for 485,242 tons and synthetic for 872,162 tons. In December, natural rubber had accounted for 35.47% of consumption, compared with 35.75% during the year as a whole. In 1957, 538,761 tons of natural and 925,879 tons of synthetic had been consumed, or 1,464,640 tons in all, the 1958 total falling about 100,000 tons short of this figure. Natural rubber accounted for 36.78% of total consumption in 1957.

United Kingdom

Details are now available of the United Kingdom rubber position up to the end of November. Consumption of natural rubber during November, which was a four-week period, amounted to 14,190 tons, giving a weekly average of 3,547 tons, compared with the average for October of 3,543 tons, and an average in November 1957 of 3,779 tons. The November figure brought the natural rubber consumption total for the first eleven months of the year to 158,941 tons, which included 23,165 tons of natural latex. Imports of natural during these months had amounted to 274,970 tons, and re-exports to 141,387 tons, leaving a total of 133,583 tons for net imports during the period. Stocks had fallen by the end of November from the January 1 total of 44,304 tons to 32,132 tons, stocks of latex included in these totals having fallen from 5,403 tons to 4,871 tons.

Imports of synthetic rubber during this period amounted to 59,121 tons, while the consumption total for the period was 56,765 tons. The November consumption total of 5,211 tons was some 400 tons above the October total and some 200 tons above the total for November 1957. Consumption of synthetic rubber to the end of November was about 5,000 tons more than consumption during the same period of 1957, representing an increase of rather less than 10%. Stocks of synthetic on hand at November 30 were 12,210 tons compared with stocks at the beginning of the year of 13,410 tons.

Thai Rubber Exports

According to trade estimates released in Bangkok, Thailand exported 6,696 tons of rubber in December, compared with exports of 10,363 tons in the previous month. This figure brought the year's exports to 137,415 tons, the 1957 exports having amounted to 132,964 tons.

The December exports went principally to the US, which took 5,604 tons, while 629 tons were taken by Singapore, 281 tons by Western Germany, 152 tons by Malaya, 20 tons by the United Kingdom and 10 tons by Japan.

Sarawak and North Borneo

The Study Group's latest News Sheet gives details of rubber exports from these two countries up to the end of last year. Sarawak's exports fell to 38,507 tons, having amounted to 40,973 tons during 1957. Of this total, 33,775 tons went to Singapore, while the United Kingdom took 1,250 tons and Hongkong 1,731 tons. Western Germany received 545 tons, Italy 414 tons and Belgium 241 tons. Smaller quantities went to France, the Netherlands, Sweden, Australia and Japan, but none were taken by the USA.

In the case of North Borneo, exports went up from the 1957 total of 19,871 tons to 20,235 tons. The three most important destinations for this rubber were Japan, Singapore and the United Kingdom, taking respectively 5,923 tons, 5,817 tons and 5,704 tons. Hongkong took 1,266 tons, Western Germany 621 tons, Italy 425 tons and the United States 285 tons. Smaller quantities went to France, the Netherlands and Canada.

Japan

The Japanese Rubber Importers' Association states that imports of synthetic rubber into Japan in 1958 totalled 13,428 tons, compared with the 1957 imports of 14,762 tons.

The United States supplied the greatest quantity of these imports, with 4,793 tons of S-Type, 1,488 tons of

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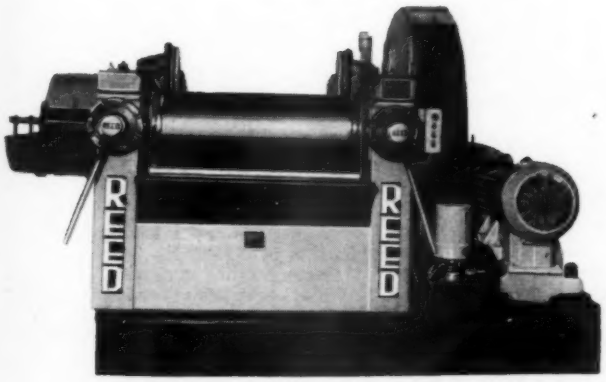

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high styrene, 923 tons of N-Type, 213 tons of butyl, and 1,276 tons of other synthetics, as well as 586 tons of synthetic latex, making a total of 9,279 tons in all. Canada supplied 3,898 tons, including 2,617 tons of S-Type, 440 tons of N-Type, 802 tons of butyl and 38 tons of latex. Imports from Western Germany amounted to 127 tons and imports from the United Kingdom to 124 tons.

IRG Discrepancy

An unusually large discrepancy in the year-end International Rubber Group World Statistics has aroused interest in rubber industry circles. Natural rubber consumption exceeded production by 137,500 tons in 1958 while stocks fell only 20,000 tons.

Explaining the imbalance, the Secretariat point out that data for Indonesia is incomplete. Total production is taken as being equivalent to total net exports plus an allowance of 2,500 tons monthly for non-reported exports plus another allowance of 1,500 tons monthly for internal consumption of smallholders' rubber. Stocks in Indonesia are placed at 75,000 tons which is purely an arbitrary figure in use until further information becomes available (this figure has been used without variation since 1953).

A further substantial discrepancy can arise from the fact that stocks afloat are estimated on the basis of 1.3 months' shipments. Small discrepancies arise from the varying base periods of statistics produced throughout the world, the Secretariat adds.

Review

FLUOROCARBONS by Merritt A. Rudner, Reinhold Publishing Corporation, Dept. B.184, 430 Park Avenue, New York 22, N.Y.

This book is one of a new series designed to give practical information to a wide range of readers. To quote from the preface, 'the series is semi-technical—that is, one does not need to be a chemist to understand the various volumes. The authors have kept in mind as probable readers such industrial men and women as: design engineers, equipment manufacturers, producers of packages, manufacturers of packaging machinery, students at technical schools and, of course, all people in the plastics industry—material manufacturers, moulders, extruders, fabricators.' The author fulfils his aim excellently as will be seen from the chapter titles, which are Fluorocarbon Resins, General Properties of the Fluorocarbons, Chemistry of the Fluorocarbons, Processing Techniques for Polytetrafluoroethylene, Processing Techniques for Polytrifluoroethylene, Effects of Fabrication on the Properties of Teflon, Electrical Applications, Mechanical Applications, Chemical Applications, Future of the Fluorocarbons.

Although the book is small it is difficult to find some of the information which it contains and the index is inadequate. The same subject matter is found under 'Safety Precautions' for one kind of polymer and 'Health Hazards' for another. The chemical side is less satisfactory than the descriptions of fabrication of the finished polymers.

Fluorothene is described as a polymeric derivative of monochlorotrifluoroethylene (page 3) and Polyfluoron (page 6) is 'a high polymer of trifluoroethylene.' Chemically, therefore, these materials are the same, and the author does not clearly describe in what way they differ.

A few small errors in the text do not detract from the value of this book which can be thoroughly recommended to all wishing to have up-to-date information in the field which it covers.

The account given of these new polymers makes fascinating reading. Here, we have materials which are stable and can be used over a phenomenally wide temperature range—in the case of Teflon for example, from −270°C. to +320°C. The coefficient of friction is remarkably low, the electrical properties are exceptional and the resistance to chemicals, including nitric acid, is almost unbelievable. Despite their high price there can be no doubt that there is a great future for fluorocarbons. This book tells users how to obtain the best results with the materials at present available.

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1. 48s. including postage.

British Standards

BS 3093. Latex Foam Rubber Hospital Mattresses is the 15th standard to be issued in a series dealing with rubber products for hospital use. This specification contains requirements for the latex foam interiors of the mattresses, and for the under cover and cover. Each mattress is required to be marked with the manufacturer's identification, the number of this standard (BS 3093) and the month and year of manufacture. The BSI's 'Kite-mark' may appear on the products of manufacturers licensed under BSI's Certification scheme.

BS 903. Methods of Testing Vulcanized Rubber; Part B17: 1959, Determination of Total Copper. Part B17 is the latest publication to be issued in the course of revising and publishing in separate parts, BS 903: 1950. The standard specifies, in relation to the determination of total copper, details of procedure and reagents and the method of expressing results.

Copies of these standards may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. Price 3s. Postage will be charged to non-subscribers.

Patent Specifications

The following information is prepared from published Patent Specifications. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 3s. 6d. per copy (including postage).

Seal for Protecting Joints in Concrete

No. 804,758. P. B. Cow and Co. Ltd. Inventors: K. Blake, F. Foulger and M. M. Heywood. Application, November 14 1955, March 15 and April 25 1956. Filed, July 26 1956. Published, November 19 1958.

The invention is for a seal for joints between concrete sections, known as bays, of aerodrome runways and roads. The seal is inserted in the upper part of the joint over a joint filler.

As shown in the sectional drawing, the seal includes a tubular member 1 in the form of two tubes 4, 5 joined together by an internal bar 6 forming

a common wall. The tubular member is provided with two sets of longitudinal flexible fins, each set comprising four fins of equal length. As shown, three fins 7, 8 of each set project upwardly from the horizontal, while one fin 9, 10 of each set projects downwardly. The seal is inserted under compression into the joint so that the fins act as keying members against the sides of the concrete. The seal is made of resilient material such as nylon, PVC, polythene or rubber so that it is readily compressed on expansion of the concrete and expands to its original size on contraction of the concrete.

PVC Compositions

No. 806,936. H. G. C. Fairweather. Communication from General Aniline and Film Corporation. Application and Filed, August 9 1956. Published, January 7 1959.

A composition comprises 80 to 97% of PVC or other vinyl halide polymer or copolymer and 20 to 3% of a homopolymer or copolymer of a N-vinyl pyrrolidone. Such compositions have excellent adhesion to glass. They may be used as laminating agents between two sheets or mats of glass, or glass fibres may be incorporated in the compositions which are then formed into unsupported films. The various homopolymers and copolymers of N-vinyl pyrollidones which may be use are listed. The preparation of the pyrollidones is described in United States Specifications Nos. 2,265,450 and 2,335,454.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

IN the past few weeks the trend in the shares of the plastics and rubber manufacturing groups has been a little more cheerful than that of the rest of markets.

Elsewhere the tone has been affected by the uncertainties inherent in the election situation. As we go to press other complications in the form of the Nyasaland troubles and the Iraqi revolt have arisen to further unsettle the investment climate.

Any situation at any given time in the stock market will throw up its imponderables but none will exercise such a restraining influence as that of an election where the outcome is in grave doubt and the issues at stake are of direct financial consequence.

Some alleviation in this situation may take place when the election date is known.

To some extent the Budget must also be taken into account. It is now apparent that it will be a good Budget and, thanks to the rapid build-up of National Savings, it is one which will give the Chancellor considerable scope. But even the 'bullish' aspects in this situation are completely overshadowed by the prevailing election winds.

It is of importance to realize in this context that London has, by tradition, followed Wall Street at a very close distance. But in the past three months the trends of London and the American market have for once become divorced. In this time London has fallen slightly whilst New York has risen by around 17½%.

In the meantime we are faced with the situation where each share is considered carefully on its merits and bought or sold accordingly, there are no general conclusions and really no general trends among industrial shares.

The plastics section has, however, fared rather better than most. As you will see from our list of shares, there is no shortage of gains although the list of new peaks established since we last went to press looks rather depleted.

There has been some evidence of continued American support for COURTAULDS and DUNLOP although, in both instances, it was really too slight to have any marked effect on the share prices.

A few weeks ago there was a spate of buying of ANGLO-AMERICAN VULCANIZED FIBRE, based, so it was thought at the time, on the hope that the interim dividend would be increased. This dividend has now been announced and the 'bulls,' if they were operating on the chance of a higher payment, are disappointed. The directors have announced an unchanged interim of 5%.

ANCHOR CHEMICAL Ordinary were a slightly firmer market following the news of a maintained final of 12½% which again brings the total for the year up to 17½%. Mr T. Martin, chairman, said in his statement accompanying the report, that sales continued steadily throughout the year and finally finished approximately as last year, just over £5¼ million sterling. 'This is particularly noteworthy because, in some instances, selling prices have had

Continued on page 410

Share Price Movements

Par Value	Company	1958-59 High	Low	Feb. 28	Latest
5/-	Albright & W. Ord. ..	21/3	13/4½	20/3	20/3
£1	„ „ „ 5% Pref...	16/7½	15/4½	16/3	16/3
5/-	Anchor Chemical Ord...	11/6	10/3	10/9	11/-
5/-	Andersons Rub. Ord. ..	4/3¾	3/-	3/1½	3/1½
2/-	Anglo-Amer. Vulc. Fibre Ord.	4/3	2/-	3/10½	3/10½
£1	Angus Geo. Ord. ..	29/10½	21/-	27/6	28/-
5/-	Armitage (Sir Elk.) Ord.	4/10½	2/3	4/6	4/6
5/-	Ault & Wiborg Ord. ..	12/10½	11/9	12/9	12/6
£1	Avon India Rubber Ord.	42/-	27/-	36/10½	36/10½
£1	„ „ „ 6% Pref.	18/6	17/3	17/6	17/6
10/-	Bakelite Ord.	23/3	17/-	22/9	24/3
£1	„ 6% Pref. ..	19/6	18/3	18/3	18/3
£1	Baker Perkins Ord. ..	46/6	30/7½	45/-	46/3
4/-	Bank Bdg. Rubber Ord.	2/7½	1/6	2/-	2/-
5/-	Boake (A.) Roberts Ord.	18/6	9/-	13/-	13/-
£1	„ „ „ 5% Pref.	15/1½	13/9	13/9	13/9
4/-	Brammer H. Ord. ..	15/6	9/-	15/-	15/6
5/-	Bridge, David Ord. ..	27/9	16/3	27/6	27/6
5/-	Bright, John Ord. ..	13/10½	8/9	11/-	11/3
2/-	Brit. Ind. Plas. Ord. ..	7/7½	4/9	7/3	8/-
2/-	„ 10% (tax free) Pref.	5/9	4/8½	4/9	4/9
£1	British Xylonite Ord. ..	51/6	28/6	49/9	51/3
£1	„ „ 5% Pref.	15/6	14/-	14/9	14/9
5/-	BTR Ind. Ord.	13/3	9/4½	11/9	11/6
£1	„ „ 7½% Pref. ..	22/6	20/9	22/6	22/6
£1	Courtaulds Ord... ..	35/-	20/-	34/3¾	34/6
£1	„ 5% 1st Pref.	18/6¾	15/7½	16/6	16/9
£1	„ 6% 2nd Pref.	19/6	17/1½	19/6	19/9
4/-	Cow, P. B. Ord. ..	6/7½	3/6	6/6¾	6/6
£1	„ 5% Pref. ..	13/6	10/9	13/3	13/3
5/-	Dale, John Ord... ..	15/-	10/-	10/6	10/9
£1	„ „ 6% Pref. ..	15/10½	13/-	15/7½	15/7½
1/-	Dannimac Mfg. Ord. ..	6/2½	2/6	6/1½	5/10½
10/-	De La Rue Ord. ..	33/3	20/9	32/1½	31/-
£1	„ „ „ 3½% Pref. ..	11/9	10/-	10/9	10/3
6/8	Distillers Co. Ord. ..	27/-	15/9	25/9	25/9
£1	„ „ 6% Pref...	21/0½	19/10½	21/-	21/-
£100	„ 5% Conv. Loan	£96½	£91	£93½	£93½
£100	„ 5½% Unsec. Loan	£93½	£87 7/16	£93	£93
10/-	Dunlop Rubber Ord. ..	26/7½	14/9	25/6	24/9
£1	„ 5½% Pref.	18/9	15/10	17/3	17/3
£100	„ 3½% 1st Debs.	£73	£67¾	£72½	£72¾
£100	„ 4½% 2nd Debs.	£82¾	£78	£82½	£82½
4/-	Ebonite Cont. Ord. ..	15/3	7/6	14/9	14/4½

Par Value	Company	1958-59 High	Low	Feb. 28	Latest
£1	English China Clays Ord.	57/-	29/9	53/9	56/3
£1	Goodyear Tyre 4% Pref.	12/9	12/-	12/6	12/6
5/-	Greeff Chem. Ord. ..	17/9	14/-	16/9	16/9
10/-	„ „ 5½% Pref...	8/-	7/9	8/-	8/-
4/-	Greengate & Irwell Ord.	7/0¾	4/9	6/-	6/-
1/-	Hunt & Moscrop Ord. ..	1/5	1/1½	1/3	1/3
£1	Imp. Chem Ord. ..	38/-	28/3	36/-	35/6
£1	„ „ 5% Pref. ..	17/3	16/-	16/9	16/9
£100	„ 4½% Unsec. Loan	£88½	£80	£88	£88
£100	„ 5½% Conv. Loan	£121	£99	£117½	£117½
1/-	Kleemann (O. & M.) Ord.	5/5½	2/6	5/3	5/-
£1	„ „ 6½% Pref.	16/9	15/-	16/6	16/6
2/-	Lacrinoid Prod. Ord. ..	2/5½	1/5¾	2/4½	2/4½
5/-	Laporte Ind. Ord. ..	20/7½	13/7½	19/9	21/-
£1	„ „ 7½% Pref.	22/10½	21/10½	22/9	22/9
£1	Leyland & Birm. Rubber Ord.	—	—	77/6	50/-†
£1	„ „ 6% Pref.	21/3	16/1½	16/10½	16/10½
2/-	London Rubber ..	14/4½	8/6¾	14/3	14/3
£1	„ 6% Red. Cum. Pref.	19/9	16/3	18/9	18/9
£1	McKechnie Bros. Ord.	45/-	32/6	45/-	45/-
£1	„ „ 'A' Ord.	44/6	30/-	42/6	42/6
£1	„ „ 6% Cum. Pref.	16/3	16/-	16/3	16/3
5/-	Monsanto Chem. Ord. ..	16/4½	13/-	15/3	15/6
£1	„ „ 3¾% Pref.	12/6	11/-	12/-	12/-
£100	„ 6% Debs.	£104	£101½	£103	£103
£1	North British Rubber ..	—	—	15/3	15/3
2/-	RFD Ltd. Ord.	5/3	3/5½	4/8½	4/6
£1	„ „ 5½% Pref. ..	14/6	11/6	12/6	12/6
2/-	Rubber Imp. Ord. ..	15/-	6/-	7/-	10/-
2/-	„ „ 'A' Ord.	15/-	6/-	7/-	10/-
£1	„ 5% 1st Pref.	12/3	10/-	10/6	10/-
5/-	Rubber Reg. Ord. ..	13/-	11/-	10/6	10/-
4/-	Shaw Francis Ord. ..	18/-	9/9	17/7½	17/-
2/-	Silentbloc Ord. ..	8/6½	7/6	8/-*	7/9
2/-	Sussex Rubber Ord. ..	1/8	7½	1/4½	1/4½
5/-	Sutcliffe Speak Ord. ..	7/4½	5/-	6/3	6/4½
£1	Turner & Newall Ord. ..	73/9	52/-	70/-	70/-
£1	„ „ 7% Pref.	24/-	22/1½	23/3	23/6
5/-	Universal Asbestos Ord.	17/-	8/0¾	16/6	16/-*
5/-	Viscose Dev. Ord. ..	10/7½	6/3	10/4½	9/6
5/-	Warne William (Holdgs.) (Ord.)	11/10½	8/-	11/-	11/-

*Ex-dividend †Ex-cap.

Rubber Markets

LONDON

A further all-round advance has been recorded in the London rubber market during the past week. Fresh gains amount to about ¾d. in most in most cases with the Spot ⅝d. up at 26⅜d. per lb. The advance reflected higher advices from the East, reported Russian buying in Indonesia and optimism that consumption will rise.

Latest prices are as follows:
No. 1 RSS Spot: 26⅛d.-26¼d.
Settlement House:
April 26¼d.-26⅜d.
April/June 26⅜d.-26½d.
July/September 26⅝d.-26¾d.
October/December 26¾d.-26⅞d.
January/March 26⅞d.-27d.
No. 1 RSS cif basis ports:
March 26⅛d.-26⅜d.
April 26⅛d.-26⅜d.
Godown:
March 88¼ Straits cents nominal.

Latex

Centrifuged latex per gallon in drums, March/April shipment, 15s. 4d. seller, cif European ports. Spot, seller, 15s. 9d. Bulk, seller, 15s. 8d. Creamed, seller, 14s. 11d. Normal, seller, 11s. 7d.

SINGAPORE

After opening higher on improved overseas advices and good buying interest, the market ruled steady but quiet on March 9. Lower grades were again in good demand particularly April Nos. 2 and 3 RSS, but sellers were reserved and light offerings were high-priced. Sellers of remilled grades were conspicuous by their absence. The market was steady throughout the afternoon with buyers in almost all grades unsatisfied. Lower grades in particular were very difficult to come by and the market closed fully steady.

Straits cents per lb., fob Malayan ports to open ports

	Close	Previous Close
No. 1 RSS, March	88⅛—88⅞	87⅛—87¾
April	90⅛—90⅜	88⅞—89⅛
No. 2 RSS, March	88⅛—88¾	87 —87½
No. 3 RSS, March	88 —88½	86½—86¾
No. 4 RSS, March	87 —88	85 —86
No. 5 RSS, March	84¼—85¼	83 —83½
No. 1 RSS, Spot..	88⅞—89⅛	87½—87¾
No. 3 blanket, thick remilled, March	85 —87	83 —85
No. 1 fine pale crepe, March ..	91 —93	90 —92
2X thin brown crepe, spot ..	84 —85	82 —83

Tendency: Very Steady.

The Industrial Syndicate quote latex, native produce, 60% centrifugal, packed in rec. drums fob at 170.80d. per gallon.

BANGKOK

No. 1 RSS

The price for No. 1 RSS, at Bangkok on March 9 was 28.87½ (28.62½) US cents per lb.

NEW YORK

The following prices ruled in New York on March 9:

Dealers' Prices

US cents per lb.

	March 9	Previous
No. 1 RSS, Mar.	31⅛b–31⅜a	31⅛b–31⅜a
Apr.	31⅛b–31⅜a	31⅛b–31⅜a
No. 2 RSS, Mar.	31⅛b–31⅛a	30⅞b–31a
Apr.	31⅛b–31⅛a	30⅞b–31a
No. 3 RSS, Mar.	31b –31⅛a	30⅞b–30⅞a
Apr.	31b –31⅛a	30⅞b–30⅞a
No. 1 RSS, Spot	31⅛b–31⅜a	31⅛b–31⅜a
No. 3 amber blanket crepe, May	29½b–29¾a	29½b–29¾a
No. 1 latex, thin crepe, March	31⅜n	31⅛n
No. 1 latex, thick crepe, March	31⅜n	31n

Futures—Rex Contract

US cents per lb.

	Close	Prev. Close
March ..	31.40b–31.70a	31.00b–31.10a
May ..	31.80b–31.85a	31.35b–31.50a
July ..	31.85t	31.40b–31.50a
Sept. ..	31.82b–31.85a	31.40b–31.48a
Nov. ..	31.85t	31.40t
Jan. ..	31.80b–31.85a	31.31b–31.35a
March ..	31.85t	31.31t

Sales: 79 Tendency: Firm

Rubber futures were firm on commission house buying and covering in moderate volume on March 9. Traders said the firmness of foreign markets, reflecting the revolt in Iraq, and active factory buying here, aided the market. Shipment offerings were firm and well absorbed by dealers.

Crepe Rubber

The following prices ruled in New York on March 4:

Dealers' selling prices:	Cents per lb.
Sole crepe, standard grade 'A'	48 (48)
Thick crepe	32¼ (32)

Synthetic Rubber

The following prices ruled in New York on March 4:

	Mar. 4	Prev.
GR-S, fas New Orleans ..	23.25	23.25
Neoprene GN, fob Louisville	41	41
Neoprene W, fob Louisville	39	39
Butyl, fas New Orleans ..	23	23
Paracril, fob Baten Rouge ..	50	50

AMSTERDAM

The Amsterdam rubber market ruled as follows on March 9:

Guilders per kilo

	Mar. 9	Previous
March	2.51½	2.49
April	2.52½	2.51
May	2.53	2.50
June	2.53	2.50
April/June	2.55	2.51½
July	2.56	2.53
August	2.57	2.51
September	2.57	2.51
July/September ..	2.57½	2.54½

Sales: 60 Tendency: Firm

DJAKARTA

Values hardened in sympathy with better overseas advices on March 9. Good interest was noted in rubber for ready and nearby delivery. The close was steady with export certificates quoted at 332 paid/buyer.

Rupiahs per kilo

	Mar. 9	Prev.
Spot No. 1 priok ..	22.60b	22.50b
Spot No. 2 priok ..	21.80b	21.70b
Spot No. 3 priok ..	20.30b	20.20b
No. 1 fine pale crepe ..	19.90b	19.80b

Tendency: Steady quiet

CEYLON

No. 1 RSS

The price for No. 1 RSS, spot, at Colombo on March 9 was 109/110 (108) Ceylon cents per lb.

STOCK MARKET

Continued from page 409

to be reduced to meet competition and we have, therefore, had to sell more to maintain our turnover.'

After falling slightly, following the announcement of an unchanged second interim of 8½%, Monsanto Ordinary staged a rally on further consideration of the profits.

The group trading figure was up from £3,256,000 to £3,500,000, but after heavier provisions for depreciation and interest charges the net profit after taxation showed a fall of around £86,000 at £992,000.

The full report of the English China Clays group was a cheering document and it was closely followed up by news of 'ECC's' acquisition of the Croft Granite, Brick and Concrete Co. Together these two items lifted the Ordinary shares to a new peak level of 57s. This was later reduced to 56s. 3d. by a small volume of profit taking. The accounts show to the full the expansion that has taken place in the fixed assets of this group in the past year alone. This item is up from £8,000,000 to £9,600,000. The earnings and profits have already been mentioned in this column. Current assets of £5,400,000 contrast with £4,876,000 a year ago and include net cash up from £731,000 to £1,287,000. This is a very favourable circumstance indeed, but it is all the more improved by comparison with liabilities which have risen only £120,000 to £2,564,000.

British Glues and Chemicals, one of the markets' favourite takeover stocks, turned a bidder recently and bought a 50% participation in Wm. Oldroyd and Sons, gelatine manufacturers, of Widnes.

Leyland and Birmingham Rubber Ordinary shares were 'ex' the recent two-for-three 'scrip' issue. The directors have already declared the first dividend on the new capital set-up. It is an interim of 5% against the same on the old capital. Last time the total was 25%, which included a bonus of 10%.

There has been considerable activity of late in the shares of the Rubber Improvement group. The buying is said to be fairly knowledgeable and is based on the firm belief that there has been a convincing change in the profitability of the firm.

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Industry INTELLIGENCE

Technical Data

Solubility of Accelerators and Antioxidants

Data for the solubility of du Pont accelerators and antioxidants in a number of solvents are given in Report BL-344, by R. W. Bell, issued by the Elastomer Chemicals Department, E. I. du Pont De Nemours and Co. (Inc.), Wilmington 98, Del., USA. The solvents used were water, toluene, hexane, ethyl alcohol, methyl ethyl ketone, dioctyl phthalate, tetrahydrofuran, trichlorethylene and dimethyl formamide. Two methods were used for determining solubility, one for solid products and the other for liquids, and these methods are described in the report. Solubility data for accelerators and antioxidants are of interest to rubber manufacturers working with solution coatings, cements, or laminated articles involving solvent wipes.

Epoxide Resin DR 19120

Resin DR 19120 is a solid epoxide resin which with hardener DQ 19121 (phthalic anhydride) gives a hot curing system specially developed for potting and casting electrical components. Particulars of the system and properties of unfilled castings are given in Advance Information Sheet E30 issued by Bakelite Ltd., 12-18 Grosvenor Gardens, London, S.W.1. The system DR 19120—DQ 19121 has a long pot life and low viscosity when molten and the products have very good electrical properties which are retained at elevated temperatures. The hardener is melted at 130°C. and added to the resin previously heated to 120°C. The low initial viscosity of the system at 120°C. gives good penetration between components in potting and enables large proportions of inert filler to be incorporated in the mix while the long liquid life at the same temperature allows adequate time for degassing under vacuum to remove air entrapped during mixing. Only a slight exothermic reaction is developed on curing and this enables large masses to be cast without bubbling or cracking.

Spraying of Neoprene Coatings

Neoprene coatings are tough, weather well and protect metals from attack by many corrosive materials. A new system has been developed for spraying neoprene coatings of higher solids content than hitherto possible, and this results in films that are up to four times thicker per spray pass. The new system is described in Report BL-343 issued by the Elastomer Chemicals Department, E. I. du Pont de Nemours and Co. (Inc.), Wilmington 98, Del., USA. Two pressurized containers are used in the new spray method, one containing the coating at 35 to 40% solids and the other containing a suitable solvent such as xylene. The two materials are fed to a catalyst-type spray gun and the atomized mixture becomes heavily laden with solvent vapour. The solids content of the atomized material is 20 to 25% and it does not show the undesirable 'spider-web' tendency. A recipe is given in the report for a neoprene coating suitable for spraying by the new method.

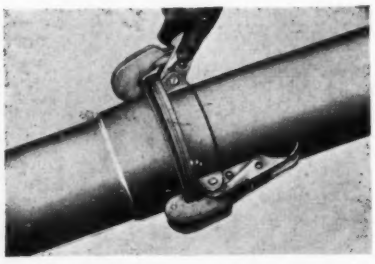
Machines, Materials and Equipment

Four Point Temperature Recorder

After extensive field trials, Fielden Electronics Ltd., Wythenshawe, Manchester, have announced their new transistorized four-point temperature recorder. This has a 10in. diameter chart and operated from the normal 50 cycles mains supply. Resistance bulbs are used as the temperature sensitive elements and low range spans are easily achieved. The use of transistors has significantly reduced the power dissipated in the instrument and has resulted in improved performance and greater reliability. Particular features are the new improved stability control and the very high reproducibility. The instrument is also available as a single point recorder with electrical or pneumatic control.

Quick-action Pipe Coupling

A quick-action pipe coupling for use on pneumatic or hydraulic pipelines has been developed by Simon Handling Engineers Ltd., Cheadle Heath, Stockport, Cheshire. Lever and claw fastenings make or break connexions in a



fraction of the time required for previous unions, and a fitted rubber sealing ring gives an airtight connexion. Each coupling consists of two rings with flanged ends. Fixed to one ring are the spring-loaded claw fasteners. A connexion is made when the two flanges are united and the claws closed over the joint so that the flanges are held tightly together, forming an airtight seal. Levers and claws are specially designed to slide easily over any surface, and when the connexion is broken the toggles are spring-loaded against the pipe to minimize damage risks. Couplings are made for welding onto 2in. to 8in. thin walled rigid or flexible pipes and for screwing onto heavier pipes.

Plastics Plant Pots

Rockite phenolic plastics plant pots, tested and approved by John Innes Horticultural Institution, and offering the nurseryman and horticulturalist marked advantages over those made with conventional materials, are now being manufactured and marketed by Therm-Plast Ltd., Rushey Lane, Tyseley, Birmingham 11. Side by side in use the pots show a space saving of 20% over their clay counterparts. They are also thin sectioned so that bulk storage space is minimized. Therm-Plast pots are available in black and four other colours in the following sizes: 2in., 2½in., 3in., 3½in. and 5in. The raw material is manufactured by British Resin Products Ltd., Devonshire House, Piccadilly, London, W.1.

Publications Received

Robac Accelerators

'Introduction and General Information,' a broadsheet issued by Robinson Brothers Ltd., Ryders Green, West Bromwich, presents, in tabular form, details of the properties and applications of the well-known Robac Accelerators. It also contains a short review of the company's progress since its introduction to the rubber trade in 1930.

Polysar Synthetic Rubbers

Brief details of current research and a list of Polysar rubbers and latices developed and produced by the Polymer Corporation Ltd., Sarnia, Canada, are given in the company's leaflet 'Hallways to New Horizons.'

North Plastochrome Gloves

New additions to the range of North Plastochrome gloves are described in a leaflet being distributed by Northide Ltd., Kirkman House, 54a Tottenham Court Road, London, W.1. Plastochrome are, it is claimed, the lightest fabric-supported industrial gloves yet to be manufactured and marketed and in tests involving the handling of intricate parts, components, assembly work, packing, shop cleaning, etc., considerable operator comfort and dexterity have been achieved.

Export Opportunities

PVC Plastic Materials—US

Moore Manufacturing Inc., a division of the Quaker Pacific Rubber Co., of 598 Potrero Avenue and 18th Street, San Francisco 10, California, has informed the British Consulate-General at San Francisco that it is interested in receiving United Kingdom offers of flexible PVC materials. The PVC can either be waste or scrap material, virgin, or reprocessed. Moore Manufacturing Inc., who were originally established in 1925, wholesale a complete line of industrial rubber products and plastics hose. They are also manufacturers of extruded plastics products, including hose and pipe. They distribute to jobbers, dealers, industrial concerns and US Government agencies. The firm have on the average 19 salesmen and 40-50 other employees. Moore Manufacturing Inc. are considered to be a suitable connexion for United Kingdom firms.

Suppliers interested in this enquiry should write by air mail direct to the US concern with small samples of the materials offered. Quotations should show both fob and cif prices in US dollars.

Responding firms should also send a copy of their initial correspondence to the British Consulate-General, 2516 Pacific Avenue, San Francisco 15, California, to enable the enquiry to be pursued: B.o.T. Ref.: ESB/4423/59.

Translucent Plastics Sheeting and Washers—South Africa

Tender No. D7605, issued by the Stores Department, South African Railways, contains the following requirements: 178 sheets, 11ft. long, straight translucent plastic, 304 sheets, 6ft. long; 304 sheets, 6ft. long, semi-opaque; 465 sheets, 7ft. long, semi-opaque (the above sheeting must conform to CCE's Specification 9/19 of 1956 and must be in accordance with CCE's Plan No. Type N.75; Sheet 36 Plastic sheeting to conform to corrugations for Everites Big Six Asbestos Cement Sheeting); 30 gross, washers for 5/16in. dia. hook bolts. Flat galvanized steel washers and plastic washers (in pairs) to suit type of sheeting supplied. Washers must conform to CCE's Specification 9/19 of 1956 and must be in accordance with CCE's Plan No. Type-N-75 Sheet 36.

Bids should be sent to the Chairman, Tender Board, P.O. Box 7784, Johannesburg. Closing date is April 3 1959. A copy of the tender documents, including Specification CCE 9/19 1956, is available for loan to UK firms. B.o.T. Ref.: ESB/5483/59.

The address of the Export Services Branch of the Board of Trade is Lacon House, Theobalds Road, London, W.C.1. Telephone number: Chancery 4411, extensions 776 or 866.

Future Events

INSTITUTION OF THE RUBBER INDUSTRY

London Section.—Tuesday March 24 at the Criterion, London, W.1, at 6.30 p.m. 'Test Tube to Tyre,' by J. Mason, A.I.R.I., Monsanto Chemicals Ltd.

Manchester Section. — Monday March 23 at the Grand Hotel, Manchester, at 6.45 p.m. 'Protection of Rubber and Some Plastics against Ageing and Weathering' by Dr W. McG. Morgan, Monsanto Chemicals Ltd.

Southern Section. — Wednesday March 18 at the Polygon Hotel, Southampton, at 7.30 p.m. 'Stress Relaxation Studies of the Ageing of Rubber' by Dr J. Scanlan, RABRM (formerly BRPRA).

PLASTICS INSTITUTE

Members of the Plastics Institute are invited to attend the March 24 meeting of the London Section, Institution of the Rubber Industry.

London and District Section.—Tuesday March 17 at the Wellcome Building, 183-193 Euston Road, London, N.W.1 at 6.30 p.m. Chairman's Lecture; 'Plastics — Why Should I Worry,' by D. S. Mahon, B.Sc., Bakelite Ltd.

Midlands Section.—Friday March 20 at the James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m. 'Plastics in the Motor Industry,' by F. C. Watkins, Clifford Covering Co. Ltd.

North-Western Section. — Friday March 20. Visit to the Plastics Division, Imperial Chemical Industries Ltd., Welwyn Garden City, Herts.

Western Section. — Wednesday March 18 at the Wheatstone Hall, Brunswick Road, Gloucester, at 7 p.m. 'Reinforced Plastics' by J. Rees, Bristol Aircraft Co.

Yorkshire Section.—Friday March 20. Annual dinner dance at Powolnys Restaurant, Leeds.

Rigidex Polythene

The price of Rigidex high density polythene has been reduced by between 2d. and 3d. per lb., depending on quantity and colour. Thus for lots of between 1 and 5 tons, Rigidex natural is now 3s. 3d. per lb. (formerly 3s. 6d.), and standard colours are 3s. 7½d. (3s. 9½d.). In addition a price schedule has been introduced for standard black, which is 3s. 6d. per lb. for 1-5 ton lots. Full details of the price changes are available on request from British Resin Products Ltd., Devonshire House, Piccadilly, London, W.1.

A £100,000 order for three 56ft. patrol launches with reinforced glass fibre hulls has been given to the shipbuilding firm of James Taylor Ltd., Shoreham, Sussex.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from "The Trade Marks Journal"—given below are reproduced by permission of the Controller of H.M. Stationery Office.

HERMEPLAST (772,540) For rolls and sheets, all made principally of paper or of paperboard or of combinations of paper or paperboard with metallic foil and films of thermoplastics, and all included in Class 16. By the Organisation Internationale du Thermosac SC, 71 Forelstraat, Ghent, Belgium. Address for service is c/o Bromhead and Co., St. Paul's Chambers, 19-23 Ludgate Hill, London, E.C.4. (Class 16; February 18 1959.)

SIDAPLAX (778,382) For synthetic resin plastics in the form of films, sheets and of plates, being goods for industrial use and included in Class 17. By Sidaplax Société Anonyme, 4 Chaussée de Charleroi, Brussels, Belgium. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. To be associated with No. 769,257 (4175, 721) and others. (Class 17; February 18 1959.)

CURON (744,165) For foamed plastics included in Class 17 in the form of sheets, slabs and of shaped sections. By the Curtiss-Wright Corporation, 50 Rockefeller Plaza, New York 20, New York State, USA. Address for service is c/o Abel and Imray, Quality House, Quality Court, Chancery Lane, London, W.C.2. (Class 17; February 18 1959.)

PILLOPREN (778,023) For all goods included in Class 16 and 19 made of plastics. By Jobro Ltd., Clifton House, 83-117 Euston Road, London, N.W.1. To be associated with No. 763,217 (4121, 700) and others. (Class 19; February 18 1959.)

GLAMOTEX (772,826) For shaped covers and shaped pads, all made of plastics and being fittings for ironing boards. By Cecil John Taylor, Carlisle House, Chatsworth Square, Carlisle, Cumberland. To be associated with No. 777,353 (4206, 205) and others. (Class 21; February 18 1959.)

GLAMOSET (777,353) For shaped covers made of foamed plastics, for toilet articles included in Class 21 and for small domestic containers. By Cecil John Taylor, Carlisle House, Chatsworth Square, Carlisle, Cumberland. To be associated with No. 772,826 (4206, 205) and others. (Class 21; February 18 1959.)

TWO-STAR (781,702) For rubber footwear and leather footwear, all being articles of clothing. By W. R. Loxley and Co. (London) Ltd., Plantation House, Fenchurch Street, London, E.C.3. (Class 25; February 18 1959.)

BILLOW (783,271) For boots, shoes, overshoes, slippers, sandals; and soles, heels and tips and protectors

therefor, all for footwear. By the Sussex Rubber Co. Ltd., School Road, Willesden, London, N.W.10. (Class 25; February 18 1959.)

MOPLEN (776,702) For articles of clothing made from plastics in sheet form. By Montecatini Societa Generale per L'Industria Mineraria e Chimica, 18 Via Filippo Turati, Milan, Italy. Address for service is c/o Eric Potter and Clarkson, 317 High Holborn, London, W.C.1. To be associated with No. 776,688 (4190, 1096) and others. (Class 25; February 18 1959.)

PATENT LIST

Printed copies of the Specifications in the following list can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on March 4 1959

Imperial Chemical Industries Ltd. H. France and A. Lister. Polymeric isocyanates and their manufacture. 809,809.

Pirelli S.p.A. Nitrile rubber compositions and accessories manufactured therefrom for electric cables. 809,722.

Badische Anilin- and Soda Fabrik A.G. Production of olefine polymers. 809,717.

Glanzstoff - Courtaulds. G.m.b.H. Manufacture of viscose structures. 809,720.

Farbenfabriken Bayer A.G. Process for producing thermoplastic polycarbonates. 809,735.

Esso Research and Engineering Co. Esterification process. 809,738.

Midland Silicones Ltd. Organohydrogenosiloxane emulsions and the treatment of fabrics therewith. 809,766.

United States Rubber Co. Manufacture of N-alky- and N-cycloalkylbis (2 - benzothiazolesulphen) amides. 809,732.

R. P. Charpentier. Mixers for substances in a liquid or viscous state. 809,998.

Open to public inspection on March 11 1959

Hudson Foam I lastics Corporation. Foamed polyester resin laminated products. 810,095.

Montecatini Soc. Generale Per L'Industria Mineraria E Chimica, and K. Ziegler. Method of polymerization of olefins and the linear high molecular weight polymers produced thereby. 810,023.

Montecatini Soc. Generale Per L'Industria Mineraria E Chimica, and K. Ziegler. Ethylene / isobutylene copolymer. 810,024.

H. Eisenberg. Viscosimeters. 810,242.

NEW COMPANIES

William J. Cox (Sales) Ltd. (619,433). — January 22. Capital: £15,000 in £1 shares. To carry on the business of dealers in plastic substances of all kinds and goods made therefrom, etc. The subscribers (each with one share) are: P. J. Bunyan and David N. Aylett, solicitor's clerks, both of 18 Austin Friars, London, E.C.2. The first directors are not named. Solicitors: Slaughter and May, 18 Austin Friars, London, E.C.2.

FDC Products Ltd. (619,470).—January 23. Capital: £100 in £1 shares. To carry on the business of manufacturers of roll metal strip coated with plastic, etc. The directors are: Geoffrey E. Fletcher, Hillcrest, Bewdley Hill, Kidderminster; Eric S. Cockayne, 59 Court Crescent, Kingswinford; Richard Baker and Gordon G. Smart. Regd. office: 35 High Street, Kingswinford.

Stella Tyres (Nuneaton) Ltd. (619,521). — January 23. Capital: £100 in £1 shares. To carry on the business of manufacturers of and agents for, and dealers in motor tyres and tubes of all kinds, etc. The directors are: Leslie G. Amiss, 70 Bills Lane, Shirley, Birmingham; Arthur R. Simmons, 7 St. Bernards Road, Sutton Coldfield; Claud A. N. May, Primrose Cottage, Marsh Lane, Solihull, directors of Stella Tyre Exports Ltd. Regd. office: Freer Street, Nuneaton.

Ryplas Distributors Ltd. (619,520). —January 23. Capital: £100 in £1 shares. To carry on the business of distributors of glass reinforced plastic, plastic substances, etc. The directors are: Lawrence A. Weller, 18 St. Catherine Road, London, E.4; Alan J. Le-Boutillier, 26 St. Catherine Road, London, E.4, directors of Rydgeway Plastics Ltd.; Ronald W. Meadows, 98 Crofton Park Road, London, S.E.4. Regd. office: 83-5 St. Mary Road, London, E.17.

Bondlite Ltd. (619,687).—January 26. Capital: £2,000 in £1 shares. To carry on the business of manufacturers and processors of and dealers in reinforced and other plastics and similar materials, etc. The subscribers (each with one share) are: Richard J. Thornton and Mrs Frances E. Thornton, both of 70a Huddersfield Road, Mirfield. The first directors are not named. Regd. office: 69 Lee Green, Mirfield, Yorks.

D. Goldsmith Ltd. (619,737). — January 27. Capital: £200 in £1 shares. To enter into an agreement with David J. R. Goldsmith, trading as 'D. Goldsmith,' and to acquire the business of a tyre dealer carried on by him at 2 Bendon Valley, Wandsworth, London, S.W.18, etc. The permanent directors are: David J. R. Goldsmith (chairman) and Mrs Mary I. Goldsmith, both of Barnfield, Cannon Grove, Fetcham, Leatherhead, Surrey. Regd. office: 2 Bendon Valley, Wandsworth, London, S.W.18.

David and Simon Ltd. (619,697).— January 27. Capital: £100 in £1 shares. To carry on the business of storekeepers in all branches, power is taken to carry on the business of manufacturers of and dealers in plastic, modelling and moulding materials, etc. The directors are: Dennis W. Longley, 9 The Windings, Sanderstead, Surrey; John A. Batchelor, director of Defiance Rubber Co. Ltd., and Mrs Lorina C. Batchelor, both of 36a Broad Green Avenue, Croydon. Regd. office: 794a London Road, Thornton Heath, Surrey.

Hildreds (1959) Ltd. (619,699).— January 27. Capital: £100 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in plastics and similar materials, engineers, tool and mould makers, etc. The subscribers (each with one share) are: Lieut.-Commander John H. Ewart, 11b Manson Place, London, S.W.7; Henry E. Goodrich, 3 Field Court, London, W.C.1, solicitor. The first directors are to be appointed by the subscribers. Regd. office: Woodside Place, Mount Pleasant, Alperton, Wembley, Mdx.

Hassia Packaging Machines Ltd. (619,855). — January 28. Capital: £1,000 in £1 shares. To carry on the business of general and mechanical and electrical engineers, manufacturers and importers of and dealers in bakery, chocolate and confectionery machinery; that of wrapping and packaging in plastic, wood or any other materials, etc. The directors are: Karl Klein, Ranstadt, Oberhessan, Hegweg, Western Germany; and Anthony Richardson, 26 Sutherland Grove, Southfields, London, S.W.18. Regd. office: Victoria House, Southampton Row, London, W.C.1.

Tulip Tyre and Rubber Ltd. (619,848).—January 28. Capital: £100 in £1 shares. The directors are: Rodney N. M. Mundy, 5 Carlyle Mansions, Chelsea, London, S.W.3, director of Metcalfe and Mundy Ltd., etc.; Jock C. Nuir, 51 Hertford Street, London, W.1; Brian K. Fry, 33 Orchurch Avenue, Gravesend. Regd. Office: 8 Bramber Road, Fulham, London, W.14.

Pang Chemical Vulcanizers Ltd.

With exterior work complete the installation of plant within the new hose factory of the North British Rubber Co. at Castle Mills, Edinburgh, is now in progress. This camera study, taken in the early evening, shows the factory area a blaze of light reflected in the calm waters of the Union Canal adjacent to Viewforth

(620,150). — February 2. Capital: £5,000 in £1 shares. To carry on the business of manufacturers of and dealers in vulcanizing materials, tyres, rubber goods and rubber repair materials, chemical, industrial and other preparations, cement, oils, drugs, etc. The subscribers (each with one share) are: Solomon Kaufman and Harry C. Seigal, solictors, both of 72 New Cavendish Street, London, W.1. The first directors are to be appointed by the subscribers. Solicitors: Kaufman and Seigal, 72 New Cavendish Street, London, W.1.

Philip Weisberg (Aquawise) Ltd. (620,341) — February 4. Capital: £5,000 in £1 shares. To carry on the business of manufacturers and makers up of and dealers in rainproof, waterproof, plastic and leather coats, aprons, leggins, and clothing manufacturers etc. The directors are: Maurice Weisberg, 159 Middleton Road, Crumpsall, Manchester 8; Sidney Weisberg, 230 Wilbraham Road, Manchester, 16; Leslie Weisburg, 18 Cavendish Road, Kersal, Salford, 7. Regd. office: Rigel Works, Rigel Street, Manchester, 4.

Basingstoke Tyre Service Ltd. (620,288).—February 4. Capital: £500 in £1 shares. The directors are: Raymond H. Chappell, 19 Austin Grove, Basingstoke; Albert R. Eccott, Canelen, 90 Hatch Lane, Old Basing, Hants. Regd. office: 14 Victoria Street, Basingstoke, Hants.

E. and H. Universal Laminated Plastics Ltd. (620,391).—February 5. Capital: £100 in £1 shares. To carry on the business of manufacturers, producers and processors of and dealers in glass fibre and synthetic resin materials of all kinds, plastic, modelling and moulding materials, etc. The directors are: Edward A. Eales, 184 Royal College Street, London, N.W.1; Margaret Hall (Flat 3) 7 Rosecroft Avenue, London, N.W.3; Solicitors: Philip Ross, Elliston and Co., 77 Wimpole Street, London, W.1.

Forfix Ltd. (F4,765).—Particulars filled on February 5 1959, pursuant to Section 407 of the Companies Act 1948. Capital: £6,000 in £1 shares. Registered in Northern Ireland on August 29 1956, as Vermiculite Industries Ltd., and renamed as above in July 1958. Formed to buy, sell, deal in and manufacture surfacing materials of all kinds, interior decorators, dealers in plastics, etc. British Address: 172 Fleet Street, E.C.4. Henry E. L. Garle, of 11 King's Bench Walk, Temple, London, E.C.4, is authorized to accept services of process and notices. The directors are: Patric Forkin, 19 Ailesbury Road, Dublin; Matthew Forkin, 52 Lower Kilmacud Road, Dublin, and Alan Brown, 16 Chichester Street, Belfast.

Plastic and Rubber Consultancies Ltd. (620,556).—February 6. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in technical advisers on the uses of plastic, etc. The subscribers (each with one share) are: James W. Hewitt, Research Chemist, and Anne M. Hewitt, Secretary, both of Tiverton Drive, Sale. Regd. office: 28 Queen Street, Manchester 2.

Bordesley Rubber Engineering Co. Ltd. (620,457)—February 6. Capital: £500 in £1 shares. To carry on the business of designers, manufacturers and factors of articles in rubber, plastics, etc. The directors are: Fred Newby, 6 Russell Road, Moseley, Birmingham 13, director of Birmingham Plastics Ltd., etc.; Leslie Page, 9a Prospect Lane, Solihull, Warwick, director of Finspa Engineering Co. Ltd, etc.; and Laurence B. Newby, 16 Greswolde Road, Solihull, director of Bordesley Rubber Co. Ltd. Regd. office: 154 Bromsgrove Street, Birmingham 5.

Rubber Journal and International Plastics CLASSIFIED ADVERTISEMENTS

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APPLICATIONS are invited for the post of rubber technologist in a progressive industrial laboratory in the London area. Applicants should have a minimum qualification of L.I.R.I. The post will require initiative and ability in technological research and development. Please apply, giving full particulars, to:—Box 311. (311)

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required in the Process Development Group of Midland Silicones Ltd., to be responsible for all the work of the Group on silicone rubbers, greases, and compounds. The work includes establishing on the pilot-scale and plant-scale the manufacture of new products and the investigation of new preparative techniques.

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(continued)

CHEMIST, young graduate for London laboratory engaged in technical developments and analysis of rubbers and plastics. Previous experience not necessary. Good salary according to ability.—Box 304. (304)

HOSE foreman required for a large hose department in factory in the South of England. Good all round knowledge of machine and hand machine made hose required, and with ability to control all the labour involved, and work to schedules under production manager. A staff appointment with good prospects, pension scheme, etc. Supply full details, which will be treated with the strictest confidence.—Box 313. (313)

IMPERIAL CHEMICAL INDUSTRIES LTD., Plastics Division, has a vacancy for a rubber technologist for work on synthetic rubbers in its Technical Service and Development Department at Welwyn Garden City. Applications are invited from men in the age range 25/30 of L.I.R.I. standard, and with experience of the rubber industry. The company works a five-day week in pleasant surroundings, and pension and profit-sharing schemes are in operation. For married men some assistance may be given towards house purchase, and temporary lodging allowances are also available. Apply briefly to the Staff Manager, Imperial Chemical Industries Ltd., Plastics Division, Black Fan Road, Welwyn Garden City, Hertfordshire. (296)

RUBBER manufacturers require two chargehands or foremen. Shift work. Moulding experience desirable but not essential, must be sound disciplinarian used to handling labour. Permanent position, good wages.—Apply Box 293. (293)

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